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COMMERCIAL FISHING PORT DEVELOPMENT IN NORTH FLORIDA

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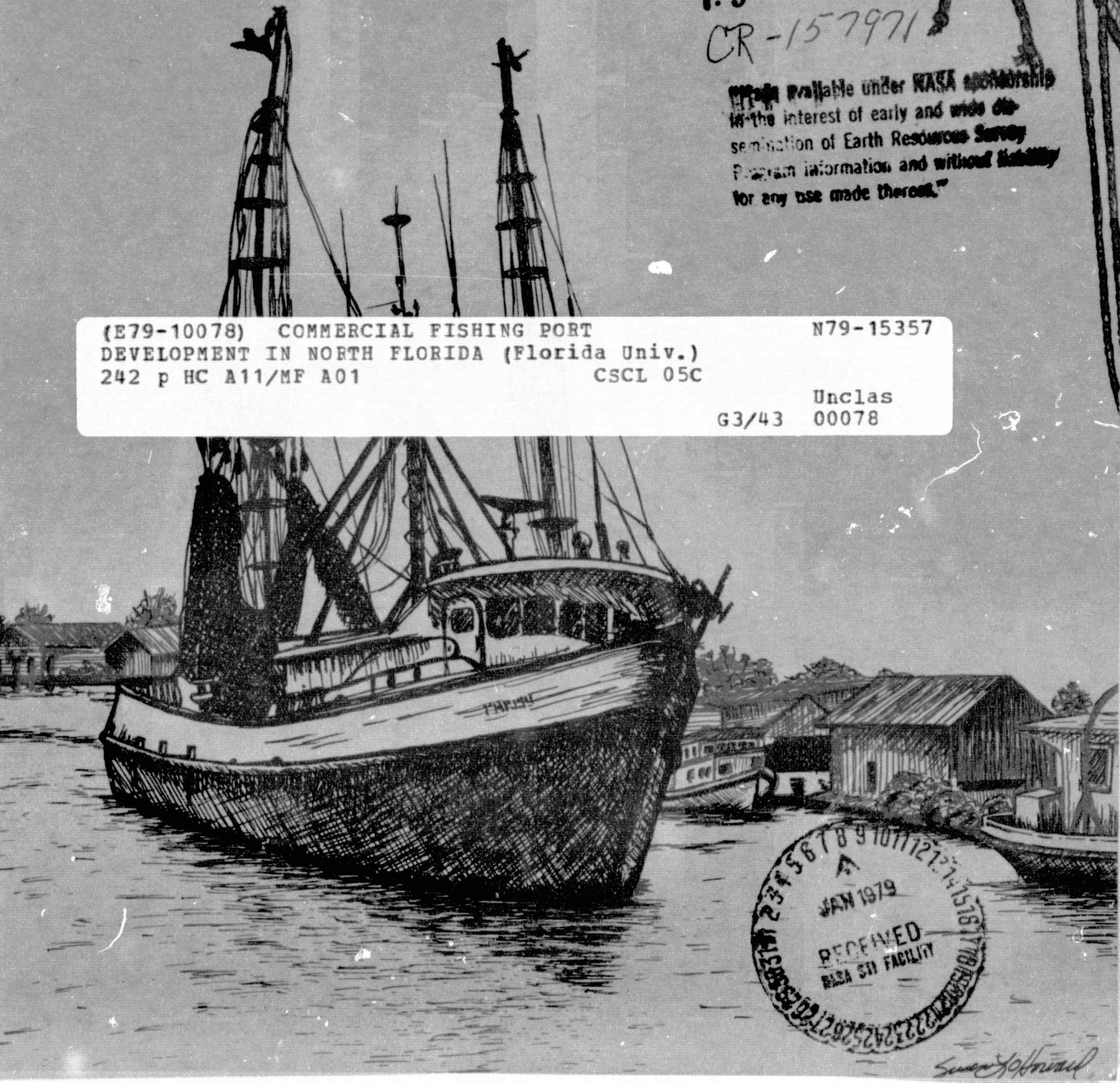
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Abstract

The seven Florida counties considered in this report contain the major fishing ports in the northern half of the state. Total 1976 landings of fish and shellfish were valued at \$22 million, provided by an estimated 1,034 boat owners and 1,610 boats. Fishing and directly related activities are major sources of income and employment in three of the seven counties, but relatively small economic sectors in the remaining four.

Trends in volumes of fish and shellfish landings have varied among the counties. All counties experienced increases from 1971 through 1973, with declines from 1973 to 1976. Added fishing effort and landings for species currently unutilized or underutilized could change the fishing industry and ports in the seven counties covered. Primary effects would be on Gulf ports, although some underutilized species are also available in the Atlantic.

Shore facilities supporting commercial fishing in the seven counties are generally inadequate. Even in northeast Florida, where numbers of fishermen and landings volumes have declined, port facilities have many shortcomings. In Gulf ports where relatively large numbers of boats land sizable volumes, most port facilities and services are seriously inadequate.

Docks and gear storage facilities are needed in nearly all ports and some need channel improvement as well. These kinds of investments would most likely be best suited for public funds, while private firms would be most likely to establish or add to ice plants, bait and fuel facilities, and gear, electronics and engine supply and repair activities. Mail surveys and personal interviews with fishermen and dealers pointed out needs for facilities and services in the seven counties.

A "package" of needed facilities and services suitable for public investment was developed for each port, with costs, revenues and a pro forma balance. Total estimated costs for all facilities in all nine ports in the seven counties were in excess of \$15 million.

Estimates of costs for a major industrial seafood port were also developed. This port, based on 600 vessels and 30 million pounds in landings, was estimated to cost \$24.4 million. Public investments were \$12.6 million, with the remainder being private capital for handling and processing, services and repair and related businesses.

Key words: Fish and shellfish landings trends, port improvements, characteristics of Florida fishermen and dealers.

COMMERCIAL FISHING PORT DEVELOPMENT IN
NORTH FLORIDA

A Report by

Kary Mathis, James C. Cato, Robert L. Degner
Paul D. Landrum and Fred J. Prochaska

A research project conducted for the
Gulf and South Atlantic Fisheries
Development Foundation, Inc.

September 1978

The Florida Agricultural Market Research Center
a part of
The Food and Resource Economics Department
Institute of Food and Agricultural Sciences
University of Florida, Gainesville, 32611

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The Florida Agricultural Market Research Center

A Service of
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SUMMARY

Commercial fishing is an important industry in north Florida, but port facilities and services are inadequate in many areas. Modern shore facilities adapted to an area's needs would improve the seafood industry and provide a number of benefits.

Commercial fishing activity and facility needs were reviewed for a 23-county area of north Florida. Seven counties were identified as having major fishing activity, nine had a intermediate level of fishing, and seven were minor fishing areas.

This report concentrates on the seven major counties: Escambia, Bay, Gulf, Franklin, Wakulla, Nassau and Duval. Population and economic activity were reviewed briefly, along with commercial fishing and port facilities.

Pensacola (Escambia County) and Panama City (Bay County) are rapidly-growing urban areas with major fishing ports. Gulf (Port St. Joe), Franklin (Apalachicola, Eastpoint, and Carrabelle) and Wakulla (Panacea) counties have considerably smaller populations than the two urban counties, with commercial fishing of relatively greater importance in the counties' economies. Duval County is a major urban area, and Nassau County population is growing rapidly.

Fifteen north Florida counties had total fish and shellfish landings of 61.3 million pounds with \$27.5 million in 1976. This represents over 39 percent of the volume and 31 percent of the value of total Florida landings.

The seven counties studied in detail had 45.2 million pounds of landings with dockside value of \$22.5 million.

Landings in Escambia County are mainly fish, with an increasing trend from 1971 to 1973 and some decline from 1973 to 1976. Shellfish landings, mainly shrimp, have been fairly stable from 1971 to 1976. October is the peak month for total landings in Escambia County.

Bay, Gulf, Franklin and Wakulla Counties form a major fishing area. Total landings of fish and shellfish for the area increased from 1971 to 1976. May and October are peak months, with January and February recording the lowest landings in the four-county area.

Landings of fish and shellfish in Nassau and Duval Counties declined from 1971 to 1976. Major decreases have been in shellfish.

An estimated 1,034 commercial fishing boat owners had 1,610 boats in the seven county area. Franklin County with 291 had the largest number of commercial boat owners while Gulf County had the fewest with 41.

Shrimp boats account for about 40 percent of the 1,610 vessels in the study area, with snapper-grouper boats representing 11 percent, crab boats 6 percent, oyster boats 11 percent, and net and other types 32 percent.

A total of 109 dealers and processors operated in the seven-county area. Blue crabs and oysters are processed mainly in Franklin and Wakulla Counties, but very little processing is done with other species or in other counties.

Fish and shellfish are shipped by dealers to the southeastern U.S., with some species moving to northeastern markets.

Port facilities and services were grouped into four categories: Handling and processing, supplies, docking and repair, and retail. Each facility or service was evaluated in a mail survey by commercial fishermen and dealers. Personal interviews and port visits provided additional information.

Docking, freezers and cold storage, and repair and supply services were identified as needing improvement in nearly all counties.

A "package" or set of facilities and services was developed for each port, based on needs identified by port users. Estimated costs and revenues were calculated.

Finding of the Remote Sensing Applications Laboratory are also included. These recommendations for the five northwest Florida counties are based on interpretation of aerial photographs, satellite imagery, an aerial survey site visit and published data.

Major needs in Pensacola include docking, ice supply, and net and engine repair services. Costs for additional docks, an ice plant and gear storage were estimated at \$3,658,600.

Port users in Panama City identified additional docking and gear storage as primary needs, along with gear repair and a marine railway. Estimated costs for docks and gear storage were \$2,860,000.

Added docking, gear storage, and ice supply, along with gear electronics and diesel repair were needed in Port St. Joe. Costs for docks, gear storage and ice plant were calculated at \$1,231,500.

Franklin County has three ports, Apalachicola, Eastpoint and Carrabelle. Facilities and services needed in each differ considerably.

Docks and gear storage, with an estimated cost of \$1,107,000, are most needed in Apalachicola. Additional docks, at a cost of \$420,000 are needed for Eastpoint. Costs of docks, gear storage and an ice plant for Carrabelle were estimated at \$2,824,100.

Panacea in Wakulla County has needs for docking, gear storage and an ice plant. Costs for these facilities were estimated at \$592,000. Also needed in Panacea were engine repair services and supplies of crab bait.

Some added dock space and ice capacity were identified needs in Fernandina Beach. Costs were calculated at \$497,500. Gear storage repair and supply were also needed, according to fishermen.

Dock space, at a cost of \$1,870,600, was needed in Mayport, along with freezer and cold storage capacity, electronics repair and additional boat-yard capacity.

Estimated annual capital repayment and operating costs were calculated for each set of port facilities for the first five years of operation. Expected revenue would exceed \$100,000 annually in the third through fifth years in Pensacola, Panama City, Port St. Joe, Carrabelle and Mayport. Revenue would exceed operating expense in these ports, but would not repay full capital cost. Estimated revenues would not cover annual operating costs in the other four ports.

Growth in commercial fishing in these seven counties will depend on increased catch of species currently underutilized or unutilized. Several species of finfish offer considerable potential for development, particularly in the Gulf.

Preliminary analysis of a single major seafood industrial port was used to illustrate facilities needed and costs involved in a port to serve 600 vessels landing 30 million pounds. Facilities were of two types - those paid for by public agencies and those built by private firms.

Total initial costs for site preparation, docks and basic buildings, the facilities provided by public funds were \$12.6 million. Estimated costs for buildings and facilities for private firms was \$8.9 million, with an additional \$2.9 million in optional facilities, primarily for processing operations.

The preliminary analysis showed that such a port is not economically feasible now. The estimate can serve two purposes, however. The first is as a starting point for detailed analysis of a major port development, and the second is for comparison with investments for improvements at existing ports.

Several public agencies have funds for port development, and can be contacted through appropriate state agencies.

COMMERCIAL FISHING PORT DEVELOPMENT IN NORTH FLORIDA

Kary Mathis, James C. Cato, Robert L. Degner,
Paul D. Landrum and Fred J. Prochaska

CHAPTER I

Introduction

Commercial fishing and seafood marketing have been important along the Florida coast for many years. Most seafood landed by commercial fishermen is distributed from a small number of major ports. The remainder is landed in a larger number of smaller landing places spaced along the coast. These ports and landing places handle more and larger vessels than ever before, and move a higher-valued catch through their facilities each year.

Even though commercial fishing is an important economic sector in many coastal areas of North Florida, relatively little expansion or improvement has been made in the shore facilities supporting fishing in recent years. Port facilities in many areas have deteriorated over the past two decades, and essential services are not available in many North Florida counties.

Public docking in North Florida ports is limited. Private seafood marketing and processing firms own most of the dock, fuel, ice and other shore facilities used by the commercial fishing fleet. These facilities are also limited due to the large investment needed for installation and the high cost of operation and maintenance.

Increased costs for all inputs used in marketing seafood have restricted expansion by most small firms, although increased retail prices for seafood have kept these firms economically viable. Recently

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retail seafood prices have increased relative to those of competing products, which may affect consumer demand adversely. This would further restrict expansion and improvement of shore facilities.

Many seafood firms are located in coastal areas considered prime for general cargo and industrial ports, tourist facilities, housing and other uses which yield higher economic returns to land owners than do seafood firms. Owners of waterfront property leased by seafood firms might wish to change the use of the property, causing the firms and fishing support facilities to relocate or face sharply increased lease costs.

Modern seafood ports, with adequate docking and necessary support services would solve many of these problems for the North Florida seafood industry. Consolidating facilities and services would lower costs and make more efficient use of available land. A modern seafood port could also provide a concentration point for buyers and sellers, central waste disposal facilities, and efficient storage facilities for seasonal products. The fishing industry would, thus, provide higher quality products and use capital more efficiently.

Modern shore facilities for commercial fishing in a particular area could be provided as improvement or expansion to an existing port or as part of a completely new port at a suitable location. Which is most suitable for a given area must be determined from the type and needs of the fishing industry in the area, existing and potential fish and shellfish resources, type and condition of current shore facilities, economic and social characteristics of the area, and other relevant factors.

Objectives

The primary objective of this project was to investigate the need for a modern seafood port in North Florida and/or the needs for improving existing ports. Specific objectives were to:

1. Determine potential suitable areas for seafood ports.
2. Determine the feasibility of alternative locations.

3. Determine the potential economic impact of a seafood port on areas considered.
4. Determine costs and returns for seafood port operation at various levels of activity.
5. Identify and describe alternative fund sources for port development and describe relevant financial factors affecting port funding and operation.

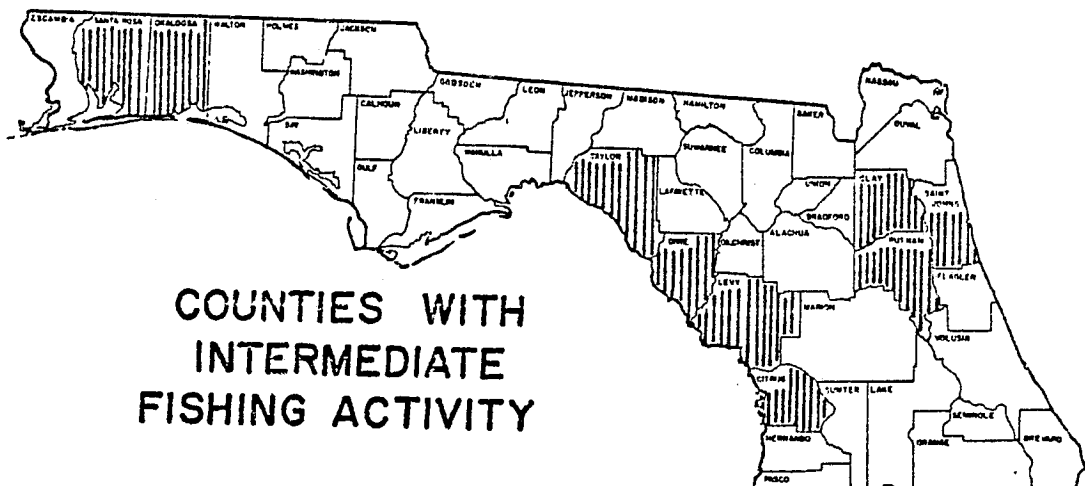
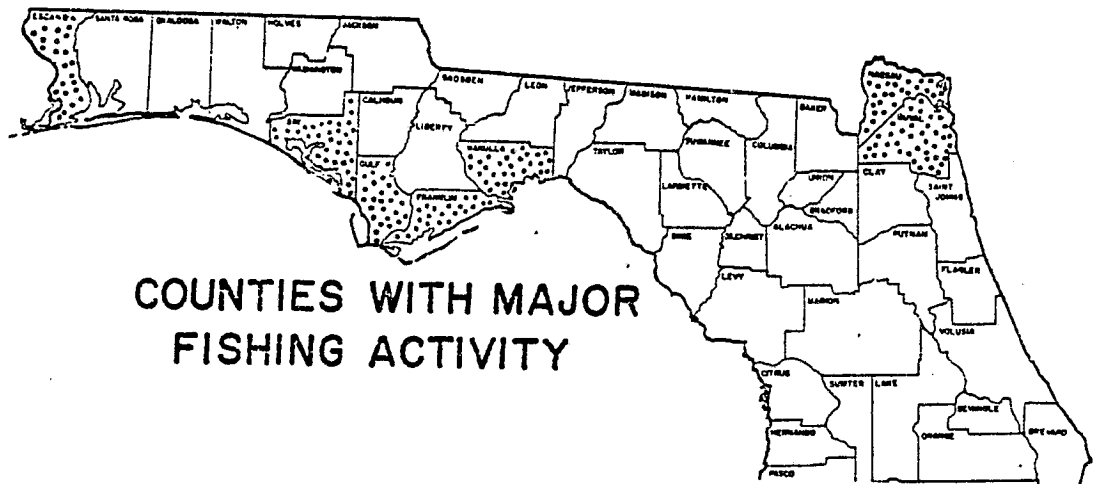
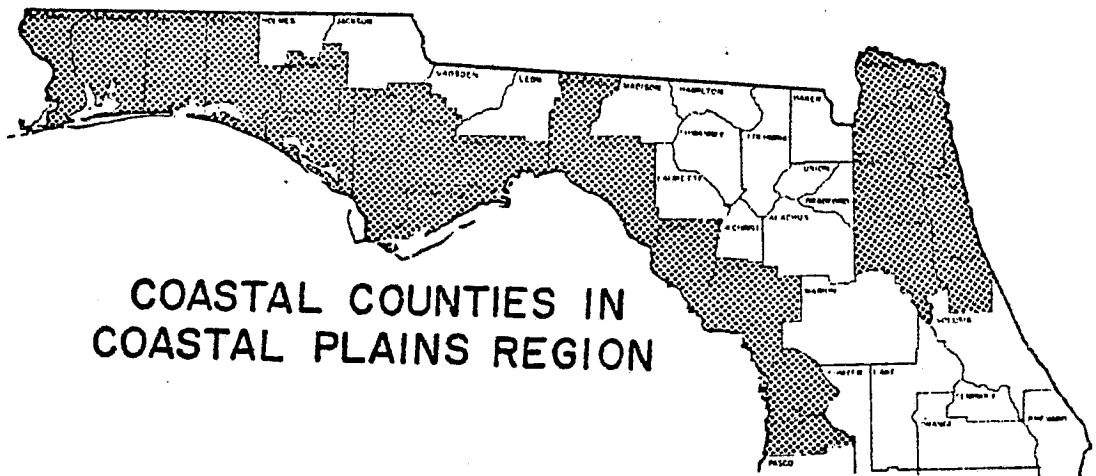
Sponsor

This study was initiated at the request of the Gulf and South Atlantic Fisheries Development Foundation, Inc. (referred to hereafter as the Foundation), who funded the major part of the direct costs of the study. The Foundation is directed by a Board of Trustees composed of two representatives from the states of Virginia, North Carolina, South Carolina, Georgia, Florida, Alabama, Mississippi, Louisiana and Texas. The Trustees represent statewide fishing trade associations or interstate fishery organizations. Representatives of individual firms or individuals closely identified with statewide fishery activities participate in the absence of a state organization. Fourteen trustees currently govern the Foundation. Fiscal support comes primarily from the Economic Development Administration and the Coastal Plains Regional Commission. Member organizations and cooperating state and federal agencies also contribute financial resources and time.

Procedures

This report presents findings meeting the objectives listed earlier, for a 23-county area of North Florida¹ (Figure 1). These counties are part of the region covered by the Coastal Plains Regional Commission, which has set aside funds for engineering studies of potential seafood ports in counties in the Coastal Plains development region.

¹A second phase of the study will survey fishermen and dealers on port needs in 17 coastal counties of central and south Florida. This second phase is scheduled to begin July 1 and be completed November 30, 1978.



**FIGURE 1.-- FLORIDA COUNTIES INCLUDED
IN SEAFOOD PORT STUDY.**

ORIGINAL PAGE 12
OF POOR QUALITY

As a part of its continuing efforts to assist development of the seafood industry, the Coastal Plains Regional Commission has directly or through state groups funded studies on the feasibility of a seafood industrial port in Georgia, South Carolina and Virginia (Coastal Area Planning and Development Commission; McKenzie, Liao and Joseph; Silverman *et al.*). These studies analyzed the feasibility of one major port development in each state. General conclusions were that a major seafood industrial port was not economically feasible in Virginia and ports were only marginally feasible in Georgia and South Carolina.

The research reported here was conducted in three stages. The first stage was a review of published data and previous studies to identify major physical, technical and economic variables related to commercial fishing in North Florida. The second stage used a mail survey to commercial fishermen and seafood dealers in the region to identify needed facilities and services. After mail survey results were analyzed, personal interviews were conducted with fishermen, dealers, suppliers, governmental personnel and others connected with the seafood industry. The third stage included analysis of interview results, determination of needed port facilities for each area and economic analysis of each group of facilities.

From the 23-county area initially considered in this study, seven counties were identified as major fishing areas. Nine counties were found to have intermediate levels of fishing activity, and the remaining seven were minor fishing areas (Table 1).

Table 1.--North Florida coastal counties grouped by level of commercial fishing activity.

Level of activity		
Major	Intermediate	Minor
Escambia	Santa Rosa	Walton
Bay	Okaloosa	Hernando
Gulf	Taylor	Calhoun
Franklin	Dixie	Liberty
Wakulla	Levy	Flagler
Nassau	Citrus	Jefferson
Duval	Clay	Washington
	Putnam	
	St. Johns	

The seven counties identified as major fishing areas, Escambia, Bay, Gulf, Franklin, Wakulla, Nassau and Duval (Figure 1), were studied in detail through personal interviews, port visits, and specific analysis of each port in these counties. The nine counties classified as having intermediate fishing activity (Figure 1) are discussed in a series of four separate reports (Mathis et al.). These nine counties, Santa Rosa, Okaloosa, Taylor, Dixie, Levy, Citrus, Clay, Putnam and St. Johns, have significant seafood landings and numbers of fishermen, but do not have larger ports and shore facilities. The seven counties with minor fishing activity are not discussed further because so little information is available.

Escambia County

Pensacola, the county seat and largest city in Escambia County, is the commercial fishing center in the county, and the largest fishing port on the northeast Gulf between Mobile and Panama City. Manufacturing, military and government activities, retail trade and construction are the major economic sectors in this growing urban area (Appendix Tables 1, 2, 3).

Population in Escambia County grew 10 percent from 1970 to 1976, and doubled between 1950 and 1976 (Appendix Table 4). County population is projected to continue increasing, with most growth in the Pensacola urban area. Escambia County is expected to show an increase of 45 percent by the year 2000 from 1976 population of 226,000 (Appendix Table 4).

Government employment provides the largest source of income in Escambia County. Total labor and proprietors' income in the county was \$1,040.9 million in 1975. About 38 percent or \$395 million was from government employment, mostly in federal agencies (Appendix Table 2). Manufacturing provided \$158.2 million in personal income in 1975, just over half of the government level (Appendix Table 3).

Dockside values of commercial fish and shellfish landings were \$2.3 million in 1975 and \$2.7 million in 1976. Commercial fishing is not identified as a separate sector in reports of income and employment. However, reliable estimates place the added economic activity generated by commercial fish and shellfish landings as one-and-a-half times landings values. That is, for each dollar's worth of fish landed, another \$1.50

of economic activity results in Escambia County (U.S. Department of Commerce). This results in a total economic impact of approximately \$5.6 million in 1975 and \$6.7 million in 1976. This additional activity, or multiplier of one-and-a-half times dockside values, does not include any added economic impact of further processing or retail sales in Escambia County. Although most fish and shellfish are shipped to other states, some are sold at retail in Pensacola and other local areas. Such trade generates some additional income that is not included in the estimates above.

Bay County

Population, the economy and the role of commercial fishing in Bay County have many similarities to Escambia County. Panama City, another rapidly-growing urban area, was the main source of a 23 percent increase in Bay County population from 1970 to 1976. The number of county residents more than doubled from 1950 to 1976, and is expected to increase by 49 percent by the year 2000 (Appendix Table 4).

Manufacturing and trade generate the largest payrolls and contribute the most to personal income among private sectors (Appendix Tables 1 and 3). Government provided about 38 percent of the total 1975 labor and proprietors' income of \$293.9 million (Appendix Table 2). Among private sectors, wholesale and retail trade provided 18 percent and manufacturing 13 percent of county personal income (Appendix Table 3). Tourism is an important user of wholesale and retail trade and services in Panama City.

Landings in Bay County from commercial fishing were valued at dockside at \$4.3 million in 1975 and \$5.0 million in 1976. The multiplier for the area is 1.63, or \$1.63 added economic activity for each dollar value of seafood landed. Landings values of \$5 million, plus additional activity of \$8.2 million give commercial fishing a total impact of \$13.2 million. This value is near the magnitude of personal income from contract construction or finance, insurance and real estate activities (Appendix Table 3).

Gulf, Franklin and Wakulla Counties

Gulf, Franklin and Wakulla Counties share many characteristics. These three contiguous counties, along with Bay, comprise the major commercial fishing area in the Coastal Plains region of Florida. Commercial fishing is an important economic sector in each of the three counties.

Franklin County, with 1976 landings valued at \$8.3 million, has by far the largest fishing industry of the three counties. Gulf County landings were \$1.2 million, while Wakulla County had \$0.5 million in landings. The Bay County multiplier of 1.63 also applies in these three counties. Total additional economic activity from seafood landings in the three counties together was \$16.3 million, making a total impact of \$26.3 million.

Manufacturing, primarily forest products, is one of the main sources of income and employment in all three counties (Appendix Table 1, 2, 3). This region is not heavily populated. Gulf County has the largest population, 10,900, followed by Wakulla with 8,700 and Franklin with 7,900 people (Appendix Table 5). Population growth has been greatest in Wakulla County, with an increase of 38 percent from 1970 to 1976 (Appendix Table 5). This has been due mainly to growth in the greater Tallahassee area just north of Wakulla County.

Gulf and Franklin Counties have shown lower percentage increases in population but have experienced relatively sizable population increases. Growth rates projected through 2000 are generally similar in all three counties (Appendix Table 5).

Nassau and Duval Counties

The two most northern counties on Florida's East Coast are part of a growing urban area. Duval County, with about 580,000 people in 1976, had a much larger population than the 30,600 in Nassau County. However, Nassau County has experienced a much higher rate of population increase. Duval County grew 16 percent from 1970 to 1976, while Nassau County showed a 49 percent increase (Appendix Table 6).

Government and manufacturing are by far the major economic sectors in both counties. All government activities provided 23 percent of Duval County personal income in 1975 and 28 percent of income in Nassau County. Manufacturing had an 11 percent share in Duval and 35 percent in Nassau County (Appendix Tables 2 and 3).

Commercial fish landings in Nassau County, excluding menhaden, had a dockside value of \$1.7 million in 1975 and \$1.9 million in 1976. Duval County landings were \$2.2 million in 1975 and \$2.5 million in 1976. With \$1.80 in added activity resulting from each dollar of landings, additional economic impact in the two counties together in 1976 would be about \$7.8 million. Total direct and added economic impact was \$12.3 million in 1976. As with all these estimates, no additional impact is calculated from further processing or retail sales in the local area.

CHAPTER II
THE FISHING AND SEAFOOD INDUSTRY
Fishery Resources

Landings of fish and shellfish products in Florida during 1976 totaled 156.4 million pounds valued at \$87.9 million at dockside. Fish accounted for 96.6 million pounds worth \$27.5 million while shellfish landings of 59.8 million pounds were valued at \$60.3 million (Table 2).

Thirty-three Florida coastal counties report commercial landings of fish and shellfish. Several counties report landings jointly which leaves a total of 31 counties or groups of counties for which commercial landing activity can be compared. Eleven counties reported landings with a dockside value in excess of \$2 million in 1976 (Table 2 and Figure 2). Monroe County accounted for 26.9 percent of Florida's total with \$23.6 million. Other counties over \$3 million were Lee (\$12.7 million) Franklin (\$8.3 million), Pinellas (\$5.2 million), Bay (\$5.0 million) and Hillsborough (\$3.1 million). Dade, Escambia, Brevard, Duval and St. Lucie Counties each had landings valued between \$2 and \$3 million. After the leading eleven counties, another seven reported landings worth between \$1 and \$2 million (Table 2 and Figure 2). Of the remaining 13 counties, nine reported dockside values between \$0.5 and \$1 million and four had landing values less than \$0.5 million.

Counties within the Coastal Plains region (Figure 1) represent 15 of the 31 groups of counties reporting commercial fishing activity. These 15 had total landings of 61.3 million pounds worth \$27.5 million in 1976. This represents 39.2 percent of Florida's landings and 31.3 percent of dockside value of landings. Fish landings in the Coastal Plains counties were 35.8 million pounds while shellfish landings were 25.6 million pounds. Fish and shellfish values were 9.3 and \$18.2 million, respectively. Total landings during 1976 in the seven counties selected for detailed study were 45.2 million pounds valued at \$22.5 million.

Table 2. Value and volume of seafood landings for Florida counties, 1976.

County	Value			Volume		
	Fish	Shellfish	Total ^a	Fish	Shellfish	Total ^a
	-----1,000 dollars-----			-----1,000 pounds-----		
Monroe	3,641	19,965	23,606	11,922	15,244	27,165
Lee	3,434	9,283	12,718	10,260	5,348	15,608
Franklin ^b	430	7,837	8,268	1,472	9,679	11,151
Pinellas	2,169	3,070	5,239	5,116	2,591	7,706
Bay ^b	3,247	1,790	5,037	7,050	1,547	8,598
Hillsborough	170	2,933	3,103	544	2,297	2,841
Dade	521	2,464	2,984	776	1,242	2,018
Escambia ^b	927	1,752	2,679	2,634	1,071	3,705
Brevard	1,120	1,496	2,616	3,153	2,612	5,766
Duval ^b	687	1,702	2,389	1,578	1,316	2,893
St. Lucie	2,353	12	2,365	7,178	10	7,188
Nassau ^b	1,351	298	1,648	4,511	359	4,819
Manatee	471	1,018	1,488	2,360	2,693	5,054
Citrus-Pasco	666	732	1,398	2,639	817	3,456
Collier	661	592	1,254	2,094	566	2,660
Volusia	305	865	1,170	4,212	789	5,001
Gulf ^b	213	1,733	1,946	9,149	1,831	10,980
Martin	1,013	3	1,017	4,935	2	4,937
Palm Beach	898	61	959	3,089	40	3,129
Indian River	865	15	881	2,667	17	2,684
Charlotte	500	314	813	2,203	703	2,906
Okaloosa	589	213	802	2,206	151	2,178
Dixie-Taylor	225	565	790	1,123	2,548	3,670
Putnam	468	199	667	1,348	1,084	2,432
Levy	113	542	655	721	2,713	3,434
St. Johns	112	497	610	249	314	563
Wakulla ^b	166	342	508	936	2,136	3,071
Sarasota	128	12	141	311	13	324
Santa Rosa	37	9	46	157	21	178
Walton	37	6	43	167	3	165
Broward	c	14	14	1	8	9
Total	27,517	60,334	87,854	96,632	59,766	156,398

^aTotals may not add due to rounding.

^bCounties within Coastal Plains region receiving detailed emphasis in this report.

^cLess than 500 dollars.

Source: Florida Department of Natural Resources, Summary of Florida Commercial Marine Landings, 1976.

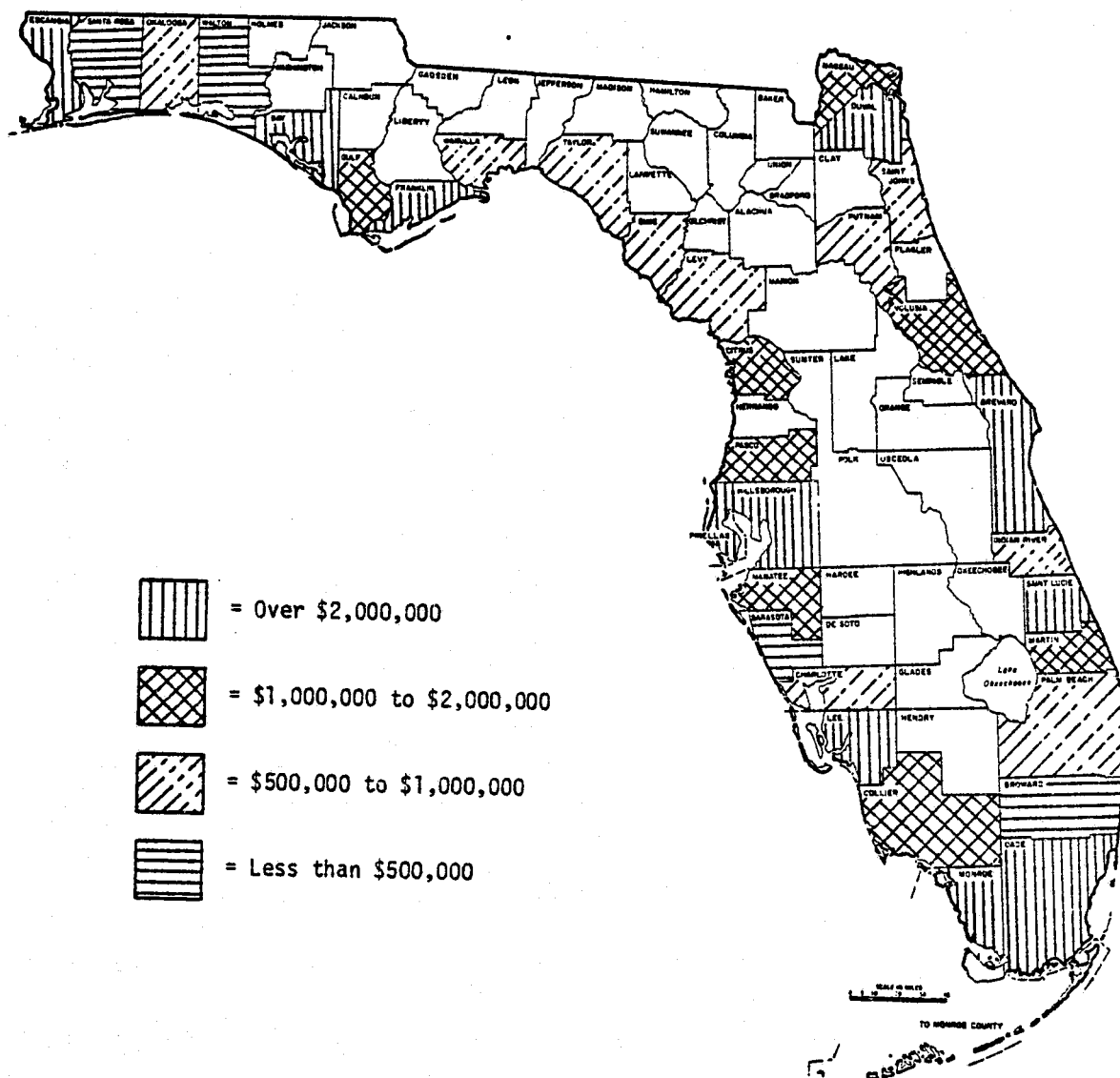


Figure 2.--Value of fish and shellfish landings by county in Florida, 1976.

This represents 73.7 percent of landings and 82.0 percent of the value for the Coastal Plains counties.

Detailed data were developed for the seven major counties studied. Data for important species landed in each county from 1971 through 1976 were analyzed for annual trends as well as seasonal landings patterns. In addition, overall increases or decreases were identified for inshore and offshore fish and shellfish landed in each county from 1967 to 1976.

Escambia County

Landings in Escambia County are predominantly fish. Highest annual landings between 1971 and 1976 occurred in 1973 when 5.6 million pounds of fish and shellfish were landed. Fish accounted for 4.6 million pounds of that total (Figure 3 and Appendix Table 7). Annual shellfish landings have been fairly stable over this period with fish landings increasing from 1971 to 1973 and then decreasing until 1976.

Average monthly landings show a seasonal pattern with lowest production coming between January and March and then steadily increasing until August (Figure 4 and Appendix Table 14). Both finfish and shellfish landings decline in September and then rebound to their highest monthly point of the year in October at 467,000 and 90,000 pounds, respectively. Landings then begin their downward trend through the winter months.

Important species in Escambia County are croaker, grouper, black mullet, red snapper, spotted sea trout and shrimp (Appendix Table 7). Highest landings usually come from croaker, black mullet, red snapper and shrimp. Landings of both inshore and offshore fish have generally increased over the period 1967 to 1975 (Table 3) although 1971 to 1976 landings show a peak in 1973. Both inshore and offshore shellfish landings have decreased over this period.

Bay, Gulf, Franklin, and Wakulla Counties

Bay, Gulf, Franklin, and Wakulla Counties are contiguous along the northwest Florida coast and form the major "area" in which commercial fishing activity is greatest in the Coastal Plains region of Florida. For this reason, annual and monthly landing trends were developed for the four-county area.

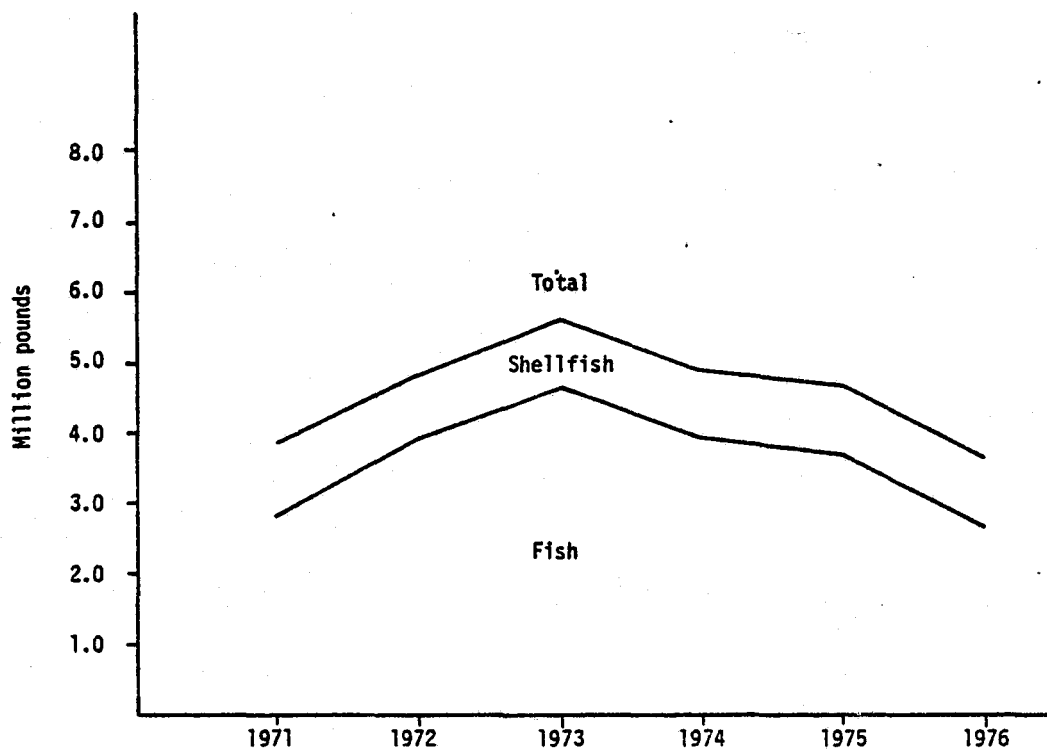


Figure 3.--Annual fish and shellfish landings in Escambia County, 1971-1976.

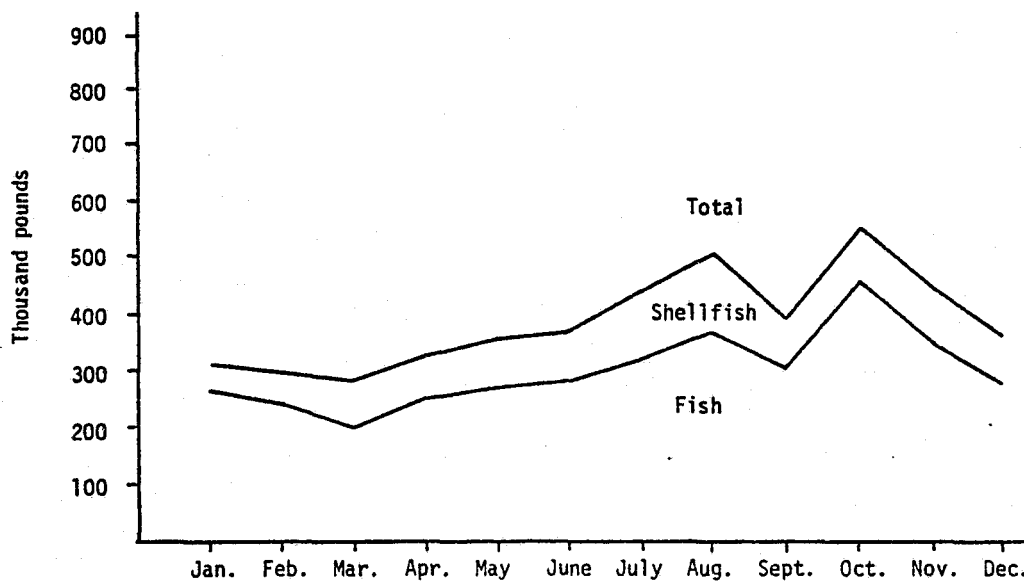


Figure 4.--Average monthly landings of fish and shellfish in Escambia County, 1971-1976.

Table 3.--Landings in 1976 and trends from 1967 to 1976 in landings of inshore and offshore fish and shellfish, seven north Florida counties.

County	Fish		Shellfish	
	Inshore	Offshore	Inshore	Offshore
----- Pounds -----				
<u>Landings, 1976</u>				
Escambia	1,465	700	28	1,087
Bay	2,739	2,320	317	1,054
Gulf	3,236	85	40	738
Franklin	1,022	352	4,245	3,033
Wakulla	740	-----	2,096	-----
	<u>7,737</u>	<u>2,757</u>	<u>6,698</u>	<u>4,825</u>
Nassau	78	45	908	918
Duval	637	318	176	1,098
	<u>715</u>	<u>363</u>	<u>1,084</u>	<u>2,016</u>
<u>Trends, 1967-1976</u>				
Escambia	Increase	Increase	Decrease	Decrease
Bay	Stable	Stable	Increase	Increase
Gulf	Increase	Decrease	Decrease	Increase
Franklin	Decrease	Decrease ^e	Decrease	Increase ^e
Wakulla	Increase	----- ^e	Increase	----- ^e
Nassau	Decrease	Decrease	Stable	Decrease
Duval	Stable	Stable	Decrease	Decrease

^aSpecies included are alewife, black mullet, blue runner, cigarfish, flounder, king whiting, ladyfish, menhaden (except Nassau County), sea trout (white), sea trout (spotted), spot, and thread herring. Some of these fish are caught in offshore waters, particularly in shrimp trawls. However, these species are caught inshore.

^bSpecies included are croaker, grouper, red snapper, and Spanish mackerel. Some croaker are caught inshore. However, nearly all commercial landings sold for food are caught offshore.

^cSpecies included are blue crabs and oysters.

^dIncludes all species of shrimp.

^eNo landings in these categories.

Source: Calculated from Florida Department of Natural Resources, Summary of Florida Commercial Marine Landings, 1976.

Total landings of both fish and shellfish for the area have increased from 1971 to 1976 (Figure 5 and Appendix Tables 8-11). Fish landings reached a peak of about 15 million pounds in 1973 and have since been below that level but still remain above 1971 and 1972 landings. Shellfish landings have shown slightly increasing trends. Landings of slightly over 11 million pounds occurred in 1971 and 1972. Almost 13 million pounds were reported in 1973 and between 14 and 15 million pounds were landed from 1974 through 1976. Total landings reached their peak in 1975 at 29.2 million pounds.

Average monthly landings show a distinct seasonal pattern with peaks in May and October of 3.1 and 2.9 million pounds, respectively (Figure 6 and Appendix Tables 8-11). Lowest landings, approximately 1.5 million pounds, occur in January and February. Fish represent the major part of the seasonal fluctuations.

Bay County.--Landings in Bay County have shown a generally increasing trend from 1971 to 1976 with some annual fluctuation in fish landings (Figure 7 and Appendix Table 8). The highest level of total landings occurred in 1975 at 9.1 million pounds. Fish represented 7.3 million pounds of this total.

Average monthly landings for Bay County reach their peak at two different times of the year. Landings are quite low from December through April, then increase in May about 150 percent due to large fish landings (Figure 8 and Appendix Table 14). Landings then decline slightly reaching a low between 700 and 800 thousand pounds in August and September. Another peak occurs in October at slightly over one million pounds. Landings then decline to their lowest levels during the winter months.

Major food species landed in Bay County are grouper, black mullet, red snapper, Spanish mackerel, shrimp and oysters (Appendix Table 8). Highest landings usually consist of black mullet, red snapper, and shrimp. Bait fish are also important in Bay County, including blue runner, cigarfish, thread herring and ladyfish. Bay County landings of bait species during 1976 were 1.7 million pounds. These fish also account for a substantial portion of the large seasonal increases in landings that occur in May and October along with black mullet and red snapper. Both inshore and offshore fish landings have been fairly stable over the 1967 to 1976 period although some increase is shown from 1971 through 1976 (Table 3).

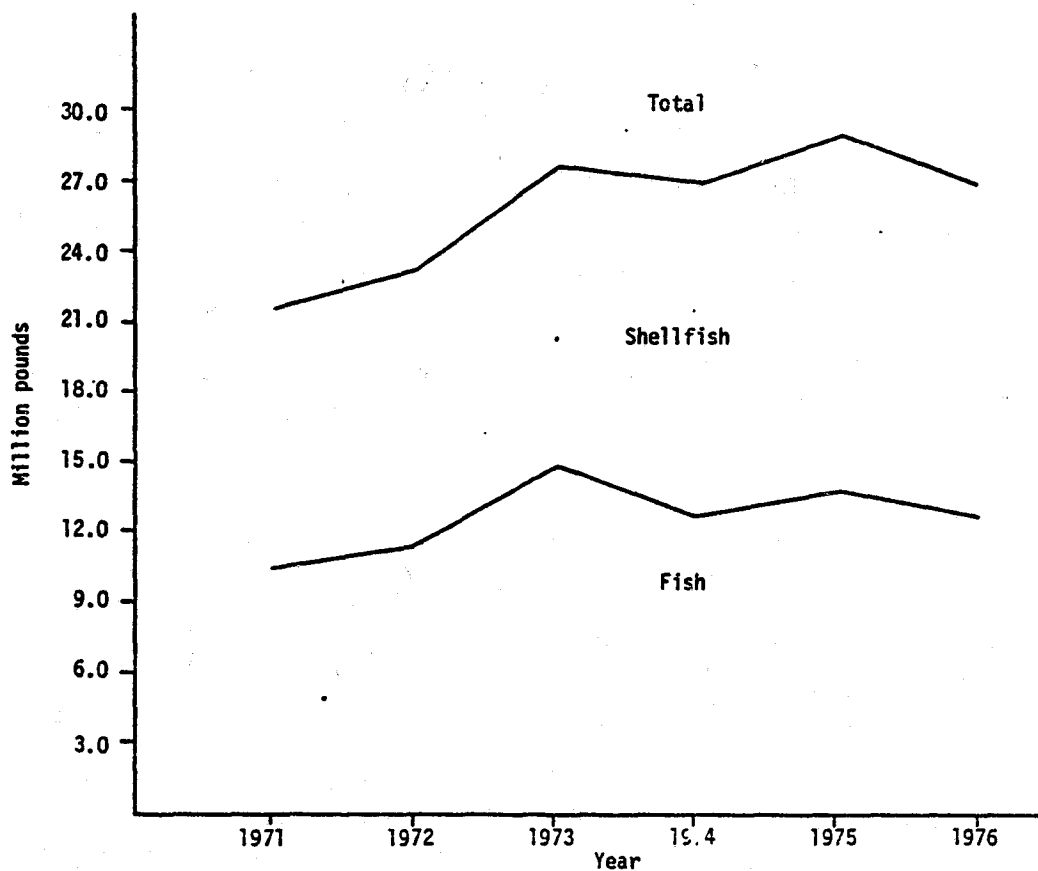


Figure 5.--Annual fish and shellfish landings in Bay, Gulf, Franklin and Wakulla Counties, 1971-1976.

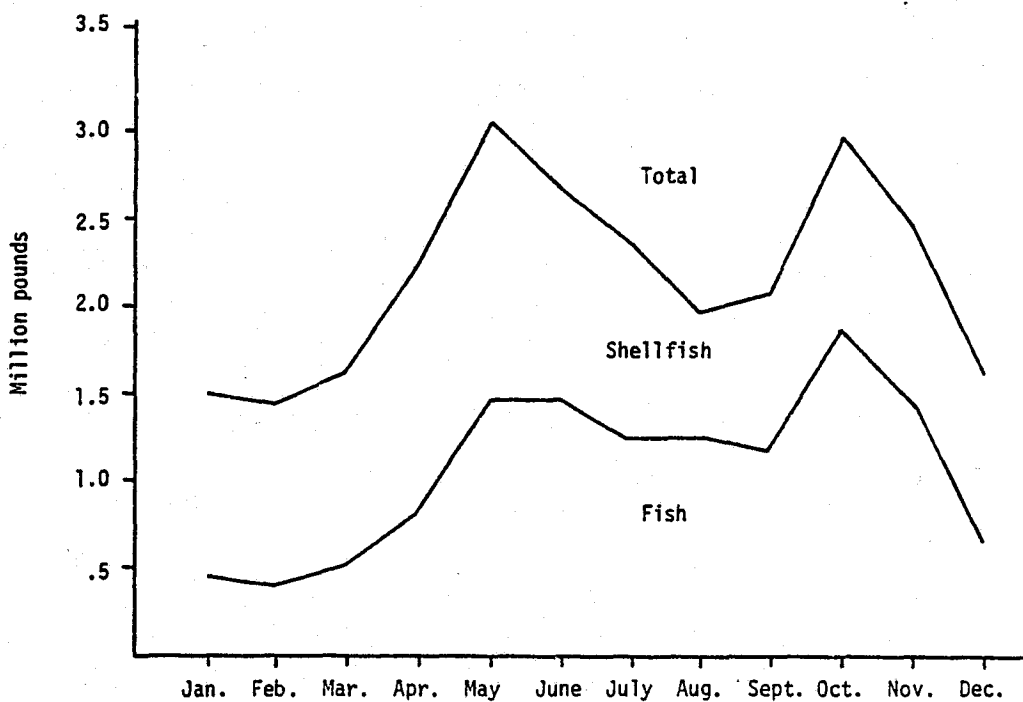


Figure 6.--Average monthly landings of fish and shellfish in Bay, Gulf, Franklin, and Wakulla Counties, 1971-1976.

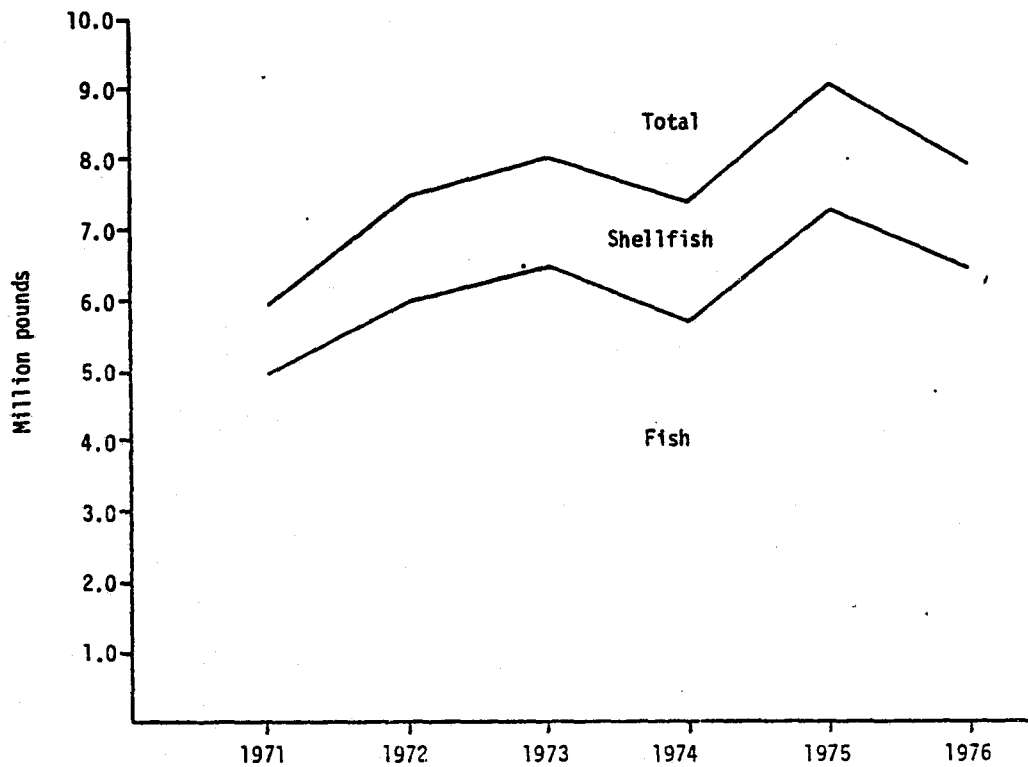


Figure 7.--Annual fish and shellfish landings in Bay County, 1971-1976.

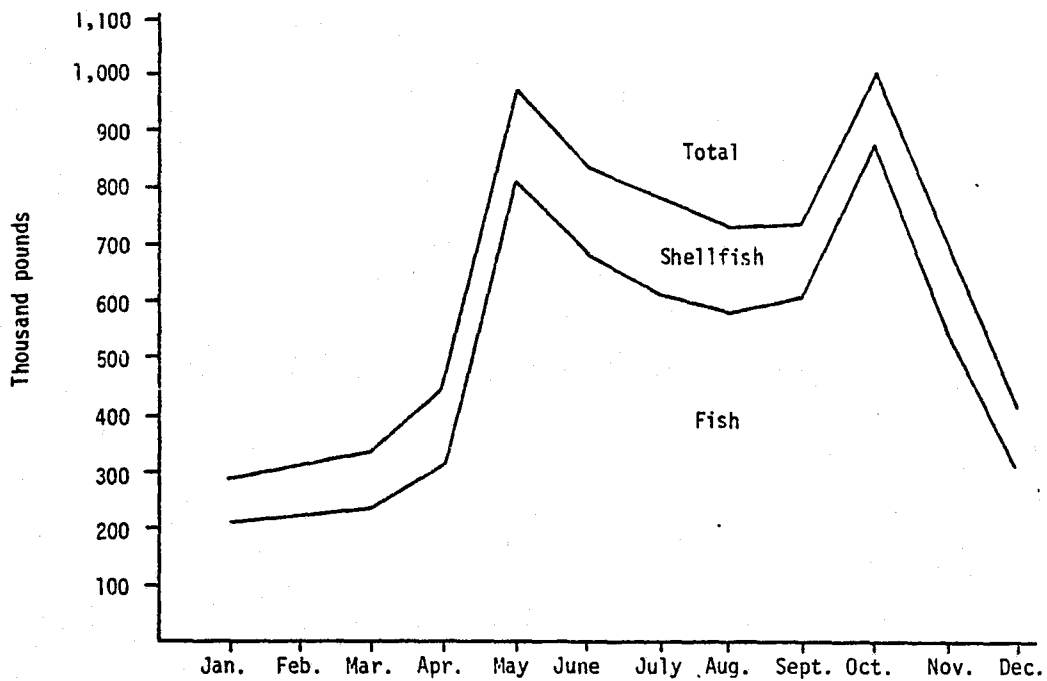


Figure 8.--Average monthly landings of fish and shellfish in Bay County, 1971-1976.

Fish landings in Bay County account for 39 percent of inshore and 85 percent of offshore fish in the four-county area. Inshore shellfish landings have shown a slight decrease while offshore shellfish landings have increased from 1967 to 1976. Offshore shellfish landings account for 22 percent of the four-county total.

Gulf County.--Total landings of fish and shellfish have shown an overall upward trend in Gulf County from 1971 through 1976 with almost all the increase in fish landings (Figure 9 and Appendix Table 9). Years with highest landings were 1973 (5.1 million pounds) and 1976 (5.0 million pounds). Fish accounted for 4.4 and 4.2 million pounds, respectively for these years.

Average monthly landings have the same pattern as in adjoining Bay County. Landings are lowest from December through March and reach peaks in May, June and October (Figure 10 and Appendix Table 14). The highest level of landings occurs in October when 654,000 pounds are landed. Fish represent 586,000 pounds of peak October landings.

Major food species landed in Gulf County are grouper, black mullet, red snapper, Spanish mackerel, shrimp, and oysters, with black mullet and shrimp leading. Major landings increases during the last few years in Gulf County have been in nonfood fish species. Fish landings in 1976 totaled 4.2 million pounds of which 2.7 million pounds consisted of fish used for non-food purposes such as bait. Major species were blue runner, menhaden, ladyfish and thread herring. Although menhaden are traditionally used in meal production, landings along the northwest Florida Coast are used as bait.

From 1967 to 1976, landings of inshore fish in Gulf County have shown an overall increase. Gulf County landings of inshore fish accounted for 42 percent of all inshore fish landings in the four-county area in 1976 (Table 3). Offshore fish landings are relatively unimportant in Gulf County. Offshore shellfish landings have increased but still comprise only eight percent of total offshore shellfish landings in the four-county region.

Franklin County.--Total landings in Franklin County have increased from 1971 through 1976 with the highest level of landings occurring in

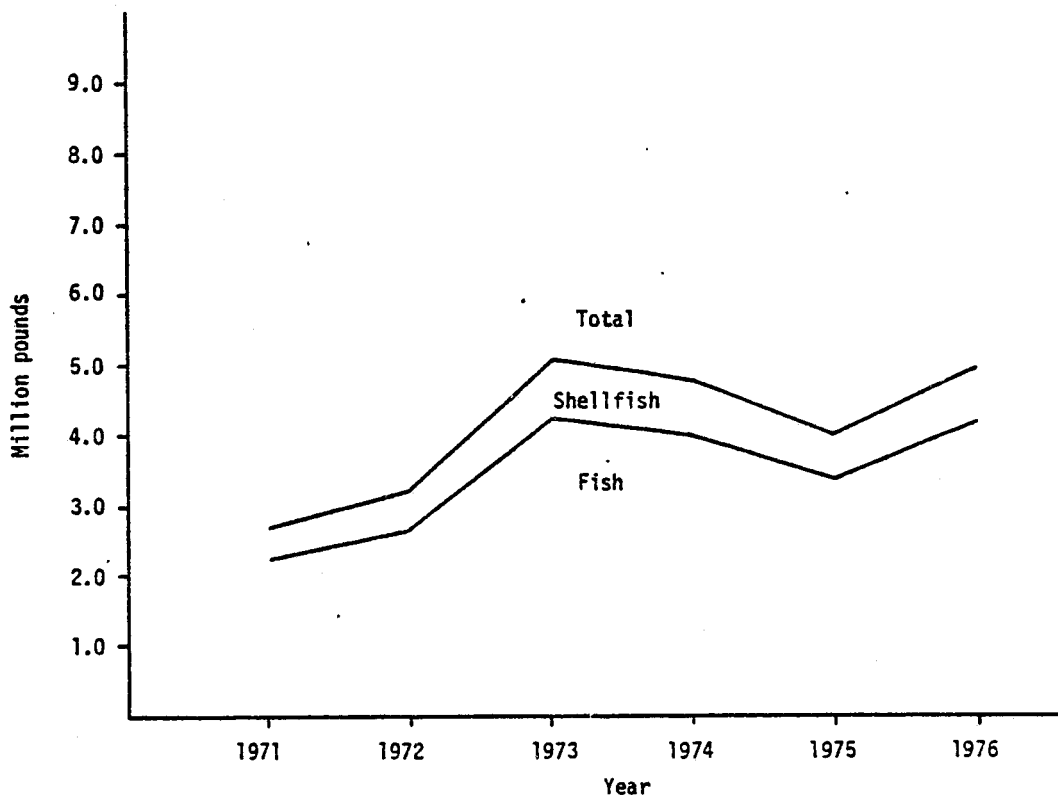


Figure 9.--Annual fish and shellfish landings in Gulf County, 1971-1976.

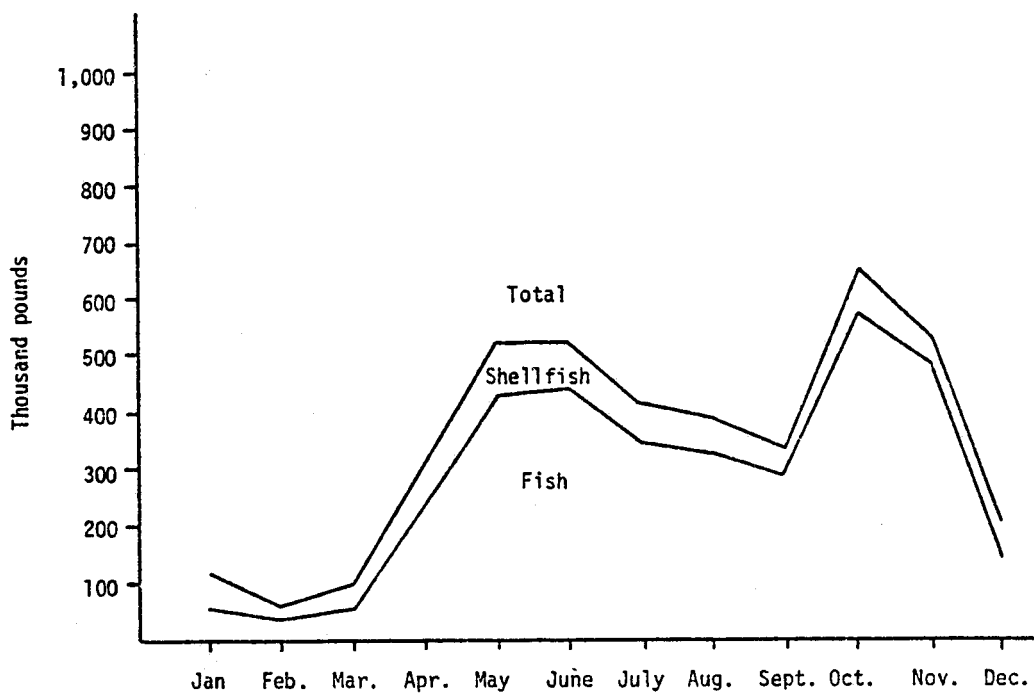


Figure 10.--Average monthly landings of fish and shellfish in Gulf County, 1971-1976.

1976 at 11.2 million pounds (Figure 11 and Appendix Table 10). This increase has come from shellfish. Fish landings declined in Franklin County from 1971 to 1976. Shellfish landings in 1976 amounted to 9.7 million pounds.

Average monthly landings of fish and shellfish in Franklin County also demonstrate two seasonal peaks (Figure 12 and Appendix Table 14). Monthly fish landings are fairly consistent throughout the year with slight peaks of around 200,000 pounds in June and October. Fish landings are lowest in February and March. Shellfish landings peak during the spring months of April and May and again during November. Landings of shellfish average 908,000 pounds in May and November landings average 659,000 pounds. Lowest landings occur during August at 357,000 pounds.

Major species in Franklin County are grouper, black mullet, red snapper, shrimp, oysters, and blue crabs, with the latter three being by far the most important (Appendix Table 10). During 1976, these three species accounted for 66 percent of total landings. Fish landings also decreased over the 1967 to 1976 period (Table 3). Inshore and offshore fish landings in Franklin County each comprise 13 percent of those categories of landings in the four-county area. Inshore shellfish landings have decreased while offshore shellfish landings have increased. It is significant that 63 percent of the four-county area landings of both inshore and offshore shellfish come from Franklin County.

Wakulla County.--Total landings in Wakulla County have shown some fluctuation from 1971 to 1976. Landings were slightly less than 5.0 million pounds in 1971 and were between 5.4 and 5.8 million pounds from 1973 through 1975. Landings were about 3.0 million pounds in 1972 and 1976 (Figure 13 and Appendix Table 11). Most of this variation comes from shellfish landings which are normally about twice the level of fish landings.

Average monthly landings are highest in Wakulla County during June when the average for 1971 through 1976 was 531,000 pounds (Figure 14 and Appendix Table 14). Total monthly landings are lowest in December and January at about 270,000 pounds. Landings increase steadily after January to the June high and then decline with a short peak in October.

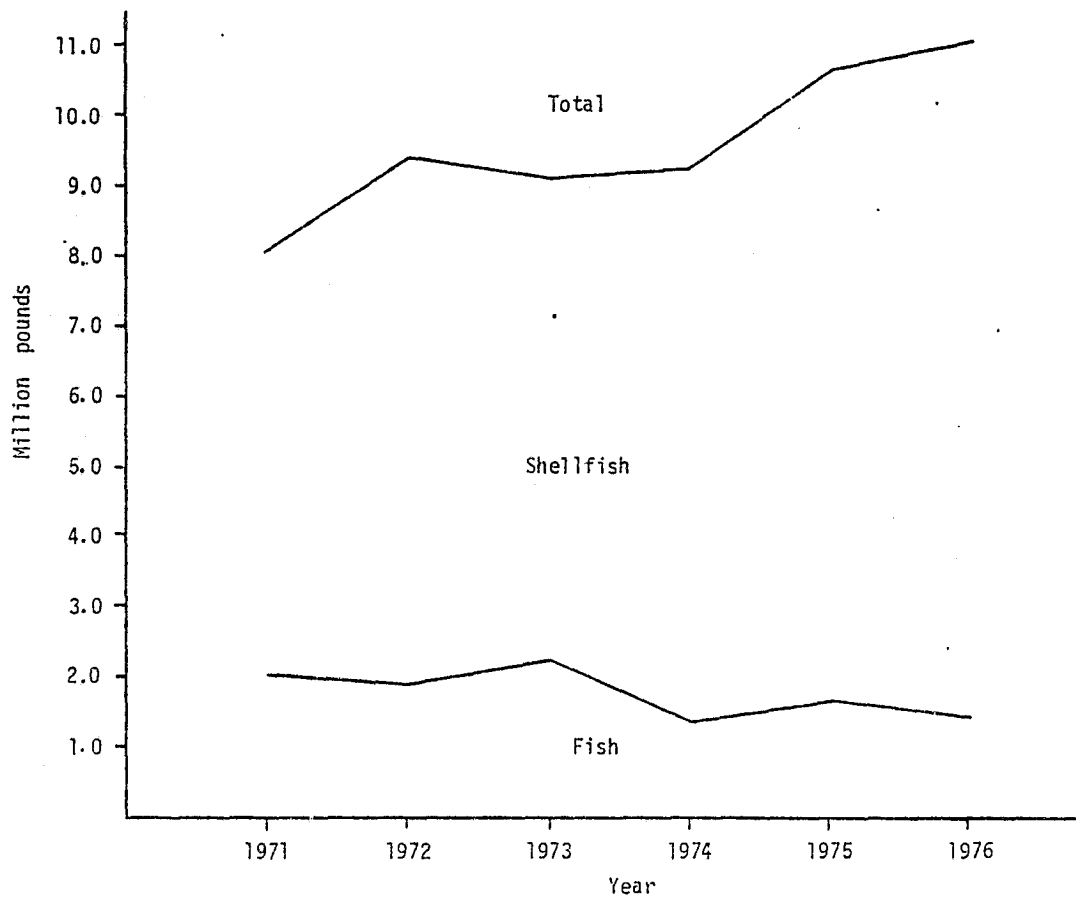


Figure 11.--Annual fish and shellfish landings in Franklin County, 1971-1976.

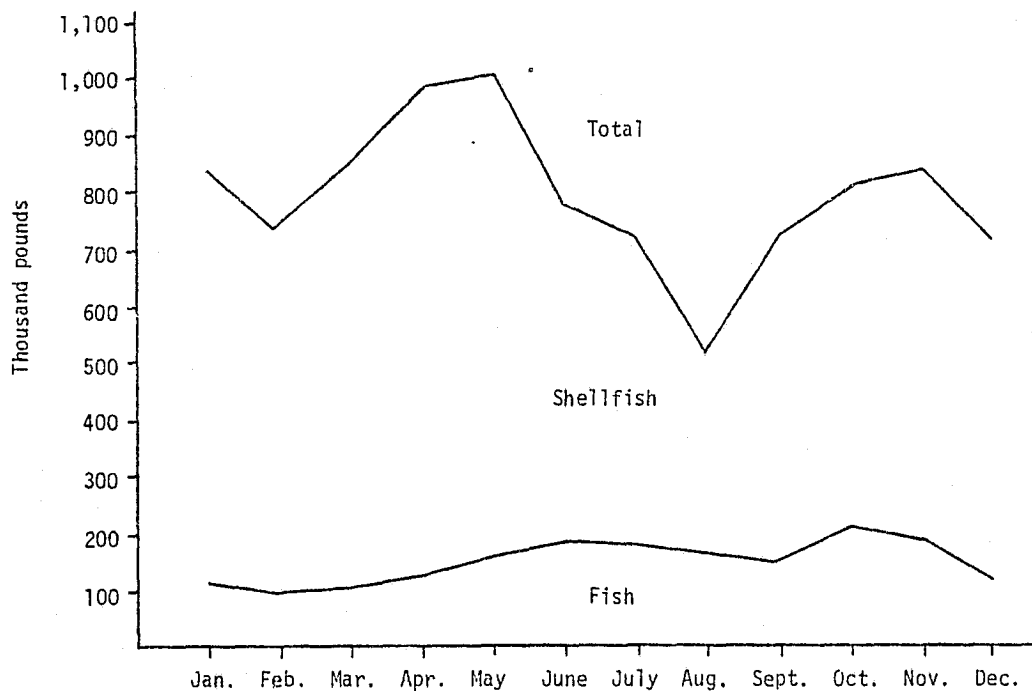


Figure 12.--Average monthly landings of fish and shellfish in Franklin County, 1971-1976.

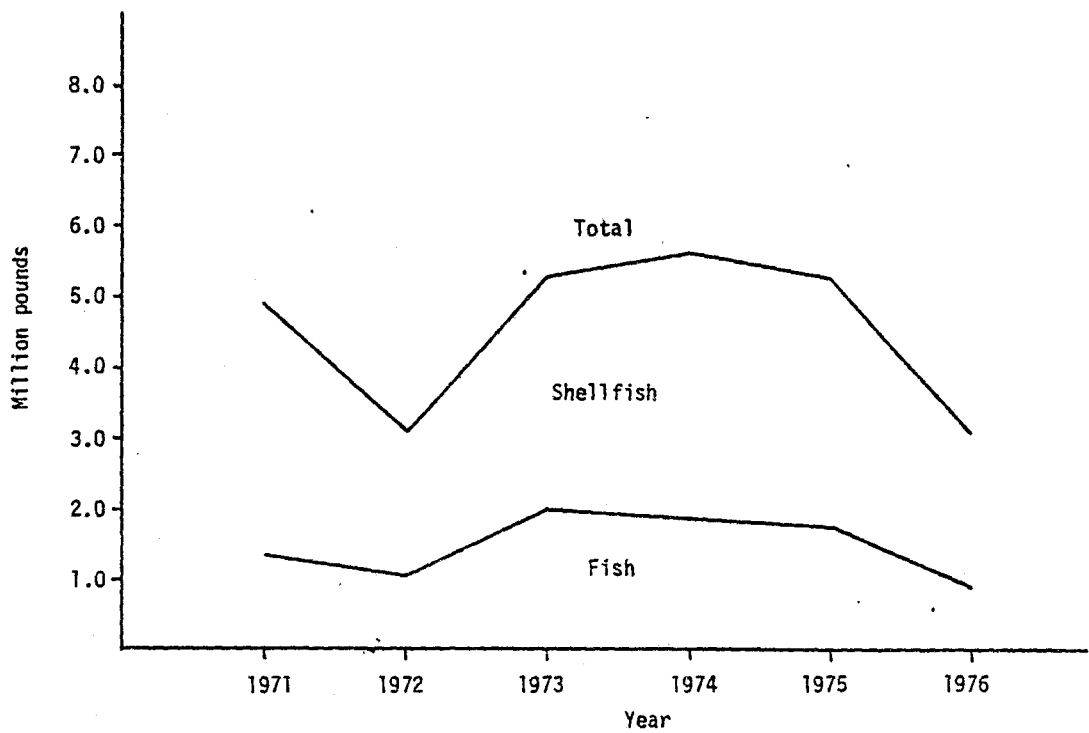


Figure 13.--Annual fish and shellfish landings in Wakulla County, 1971-1976.

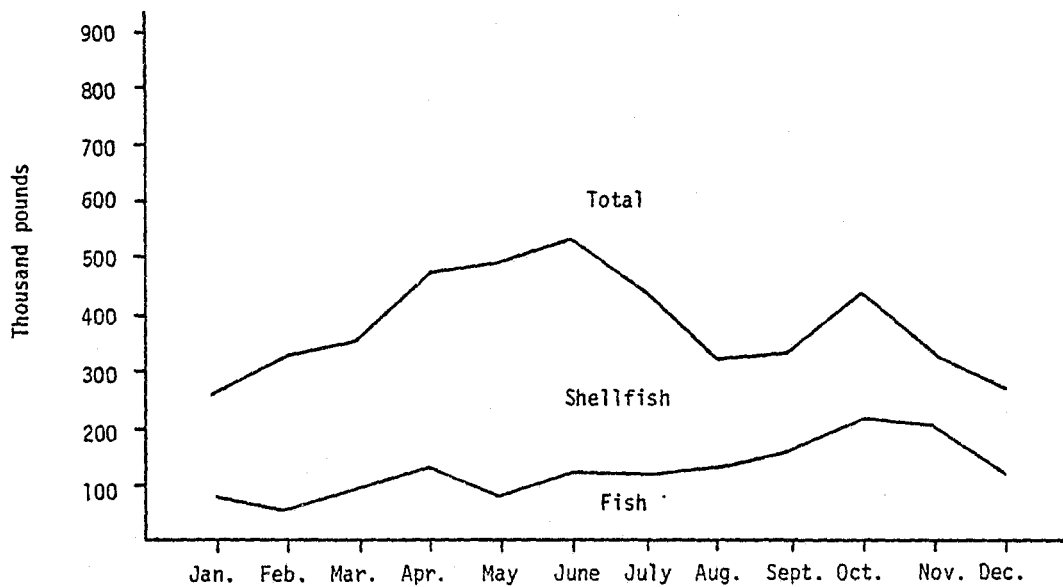


Figure 14.--Average monthly landings of fish and shellfish in Wakulla County, 1971-1976.

The brief October increase comes from fish landings which are lowest in February and rise gradually to the October high. Shellfish landings are normally highest from March through July.

Major species in Wakulla County are grouper, black mullet, red drum, spotted sea trout and blue crabs. Black mullet and blue crabs are the most important species with mullet representing 517,000 pounds and blue crabs 2.1 million pounds of the total 3.1 million pounds of landings in 1976. Both inshore fish and inshore shellfish have generally increased in Wakulla County between 1967 and 1976. These categories represent 10 and 31 percent, respectively, of landings in the four-county area (Table 3).

Nassau and Duval Counties

Total landings for the two-county area have declined somewhat from highs of slightly over 6.0 million pounds in 1971 and 1972. Landings in 1975 and 1976 were 4.7 and 4.9 million pounds, respectively (Figure 15 and Appendix Tables 12 and 13). Fish landings have shown a slight decline with the major decreases coming in shellfish.

Average monthly landings demonstrate a seasonal high in October at 625,000 pounds (Figure 16 and Appendix Table 14). The trend is generally upward with some monthly fluctuations from the lowest point of the year in February. Fish landings are normally highest in March at 281,000 pounds. Landings then decline to an August low and then peak at a lower level than March again in November. Shellfish landings are highest from September through November. October landings are highest at 459,000 pounds.

Nassau County.--Total landings in Nassau County are almost exclusively shellfish, excluding menhaden. Total landings have declined slightly with the lowest level recorded in 1973 at 1.5 million pounds (Figure 17 and Appendix Table 12). Landings of menhaden in Nassau County have ranged between 9.0 and 20.3 million pounds between the years 1971 and 1976, and are utilized primarily by a meal plant in Nassau County. The remaining fish landings amounted for only 223,000 pounds at the highest level (1971) during the last six years. Total landings of shellfish have ranged between 1.4 and 2.0 million pounds with the maximum occurring in 1971.

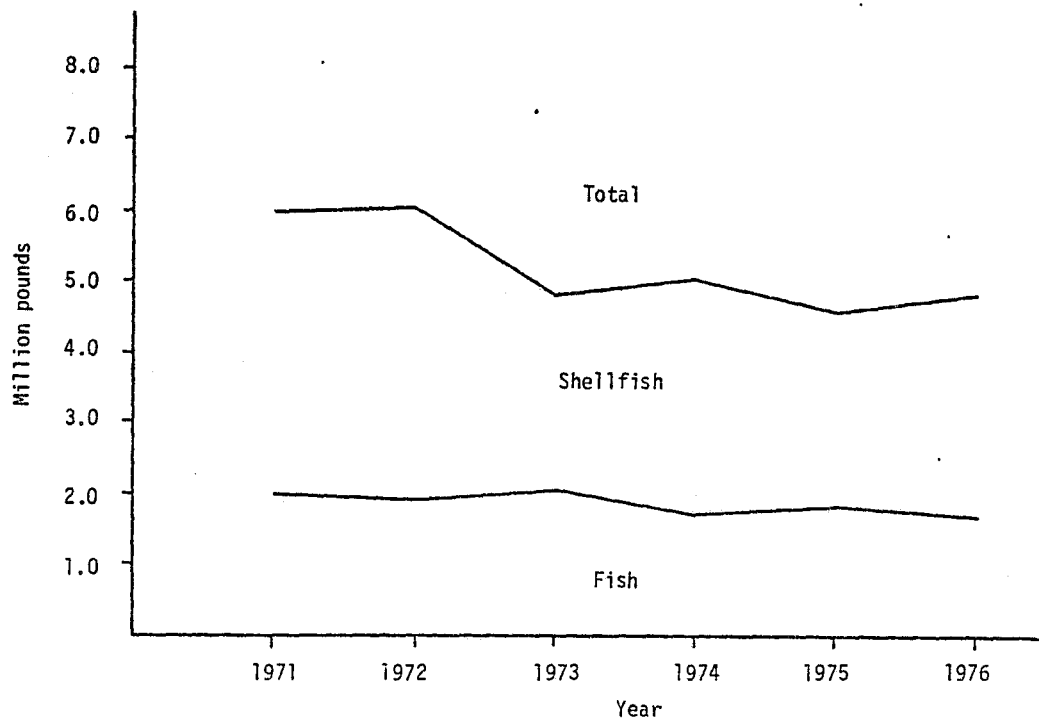


Figure 15.--Annual fish and shellfish landings in Nassau and Duval Counties, 1971-1976. (Does not include menhaden).

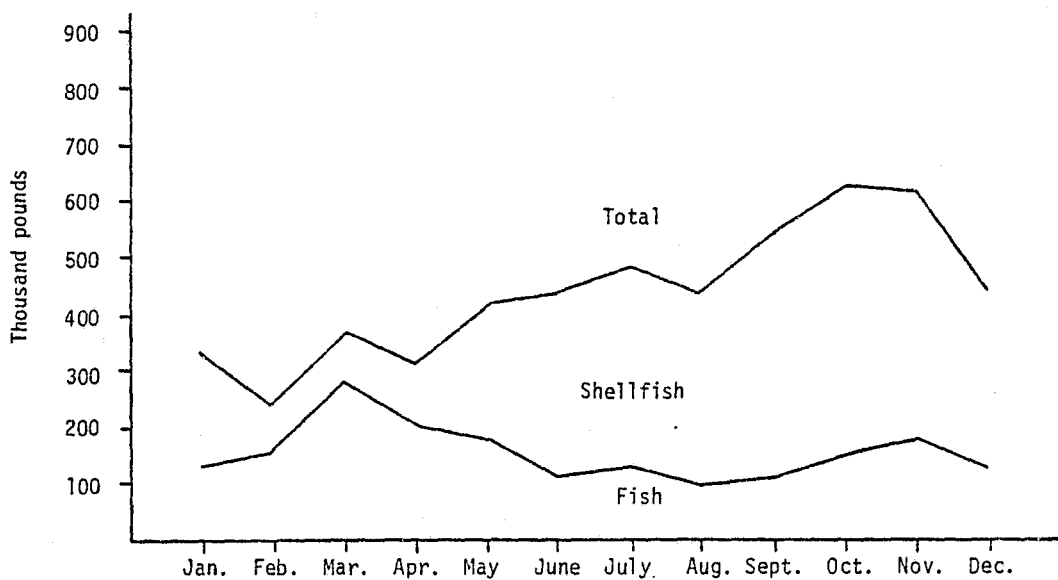


Figure 16.--Average monthly landings of fish and shellfish in Nassau and Duval Counties, 1971-1976. (Does not include menhaden).

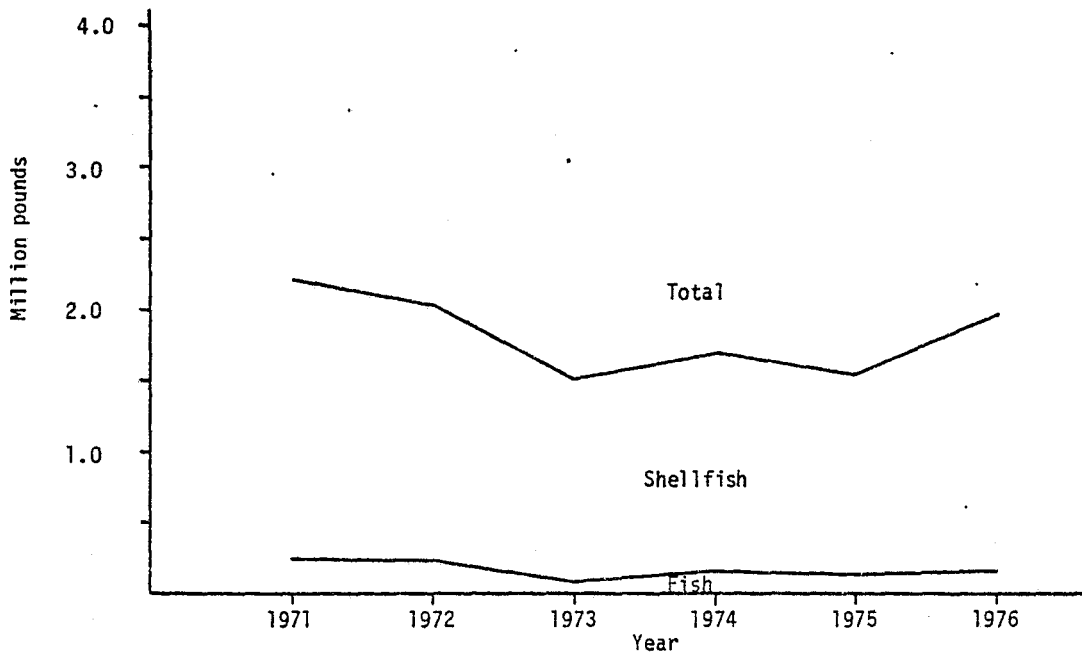


Figure 17.--Annual fish and shellfish landings in Nassau County, 1971-1976. (Does not include menhaden).

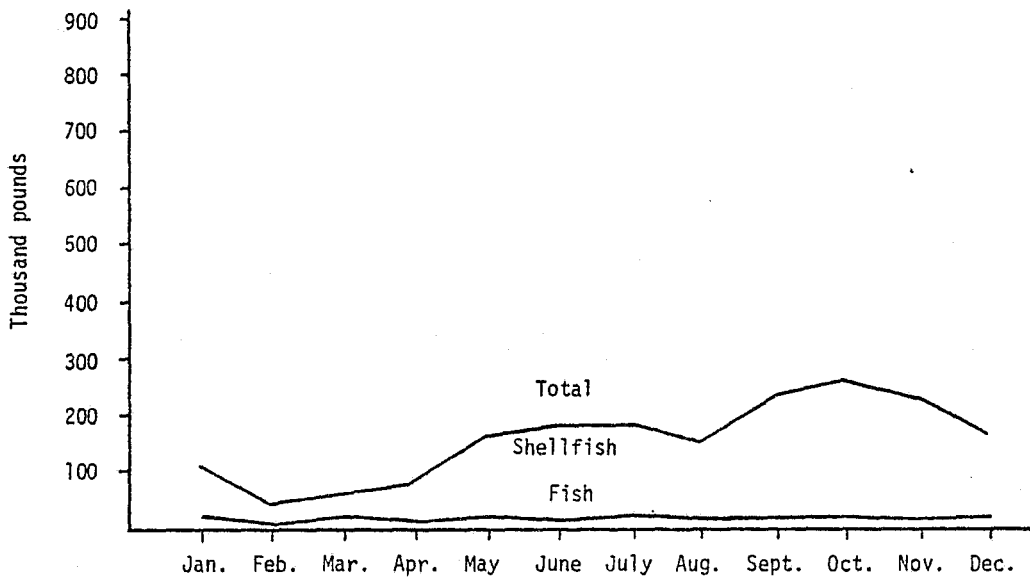


Figure 18.--Average monthly landings of fish and shellfish in Nassau County, 1971-1976. (Does not include menhaden).

Average monthly landings demonstrate definite seasonal patterns in shellfish (Figure 18 and Appendix Table 14). Shellfish landings peak in the summer months of June and July and again at a higher level in October. From 1971 to 1976, the average October landings of shellfish have amounted to 241,000 pounds. Fish landings remain fairly constant at relatively low levels.

Major species in Nassau County, excluding menhaden, are grouper, king whiting, red snapper, shrimp and blue crabs. Shrimp and blue crabs comprise the major proportion of the catch (Appendix Table 12). Both inshore and offshore fish landings have decreased from 1967 to 1976, as has offshore shellfish. Inshore shellfish, which comprise 66 percent of the Duval and Nassau catch in this category, have been relatively stable (Table 3).

Duval County.--Total landings in Duval County gradually declined from 1971 to 1976. Landings were highest in 1972 and reached a six year low in 1976 at 2.9 million pounds (Figure 19 and Appendix Table 13). Fish landings were highest in 1973 at 2.0 million pounds and lowest in 1976 at 1.6 million pounds. Shellfish landings were highest in 1972 at 2.3 million pounds. Since then, shellfish landings have been between 1.3 and 1.7 million pounds.

Average monthly landings are much more erratic and show fewer distinct peaks than counties along the northwest coast (Figure 20 and Appendix Table 14). Highest landings occur in March, September, and November (highest at 382,000 pounds), while lowest landings occur in February, July, and October. Fish landings show distinct peaks around March and November when an average of 264,000 and 171,000 pounds are landed, respectively.

Important species in Duval County are king whiting, mutton snapper, red snapper, spotted sea trout, shrimp and blue crab. King whiting and shrimp are the predominant catches. Both inshore and offshore fish catches have been relatively stable from 1967 to 1976 (Table 3). These two categories represent 89 and 88 percent, respectively, of two-county landings of the two categories. Both inshore and offshore shellfish have shown decreases. Duval-landed inshore shellfish comprise 16 percent and offshore shellfish 54 percent of the total two-county landings of these categories.

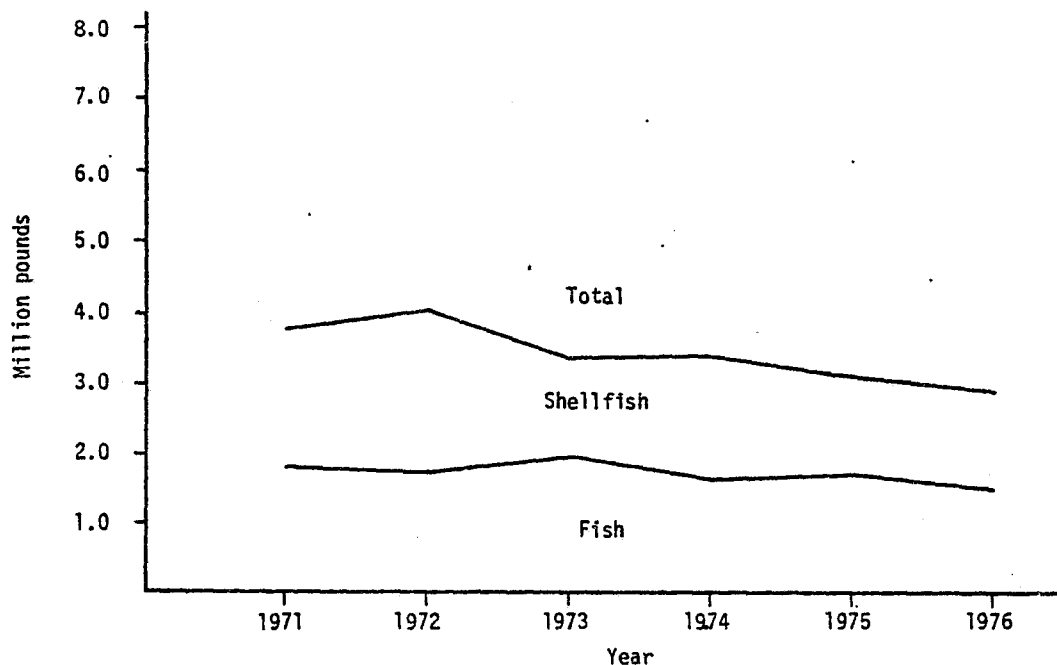


Figure 19.--Annual fish and shellfish landings in Duval County, 1971-1976.

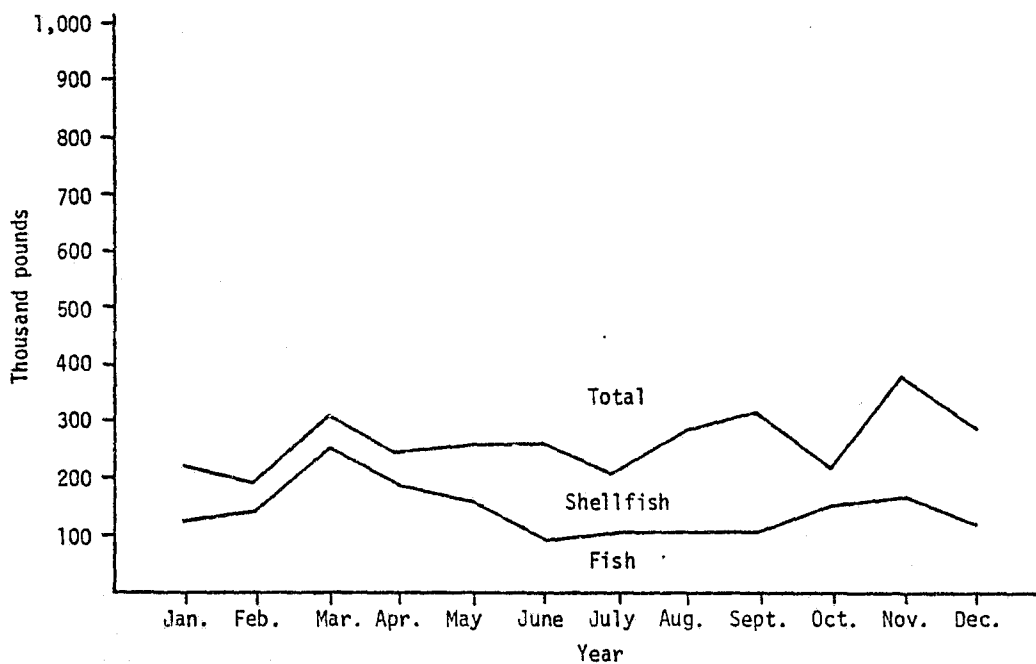


Figure 20.--Average monthly landings of fish and shellfish in Duval County, 1971-1976.

Fishermen and Fishing Craft

Data on the exact number of fishermen and commercial boats and vessels by county are not available. Consequently, estimates were made for the purposes of this study. All individual boat owners in each county who purchased commercial boat registrations in 1975 were sent questionnaires (See Appendix B). Adjustments to the boat registration list were made based on survey responses so that only those boat owners actively engaged in commercial fishing are reported as fishermen in this study. These estimates do not include crewmen nor fishermen from other areas who fish from these counties on a seasonal basis.

A total of 732 fishermen are estimated to be fishing in the five counties in the northwest Florida study area (Table 4). Franklin County leads with 291 commercial fishermen while Gulf County is low with 41 fishermen.

Duval and Nassau Counties make up the northeast region with an estimated total of 302 commercial fishermen. Duval County supports an estimated 235 fishermen. Total registered boat owners estimated in the seven county study area number 1,034.

A study by Prochaska and Cato (February 1971) reports an average of 1.5 boats and vessels per boat owner in Florida. Using this factor gives an estimated 1,610 boats and vessels having their home ports located in the study area. Other boats and vessels also operate out of ports in the area, since some owners have several boats and fishermen from outside the area fish in the region during seasonal runs. Personal surveys of the leading ports were made to provide further information on characteristics of boats and vessels. The following discussion reports the results of the survey.

In the northwest area a total of 1,157 boats and vessels fish during the peak season (Table 4). Over 40 percent (465) of the boats and vessels in the northwest area fish from the three major ports in Franklin County. An estimated 297 boats and vessels fish in northeast Florida, for a total of 1,610 in the entire study area.

Boats and vessels were grouped into five types: shrimp, snapper-grouper, oyster, crab, and net and other boats. Shrimp vessels account

for 40 percent (642 vessels) of the area total (Table 5). The largest concentration of shrimp vessels is in Franklin County with Carrabelle being the leading port. Snapper-grouper boats, estimated to number 180, are concentrated in Pensacola, Panama City and Carrabelle. Oyster boats are most numerous in Franklin County.

Table 4.--Estimated number of commercial boat owners and vessels using northwest and northeast Florida ports, 1975.

Area and county	Boat owners	Vessels
Northwest Florida		
Escambia	174	261
Bay	144	216
Gulf	41	60
Franklin	291	465
Wakulla	82	155
Total	732	1,157
Northeast Florida		
Nassau	67	101
Duval	235	352
Total	302	453
Total	1,034	1,610

Fishing craft operating from northwest Florida ports vary considerably in length and draft. Shrimp boats range in length from 40 to 100 feet with draft from 6 to 12 feet (Table 5). Snapper-grouper boats generally range from 40 to 60 feet in length and 4 to 8 feet draft. Crab and oyster boats are generally from 20 to 27 feet in length and 2 to 3 feet in draft.

Most vessel owners in the seven-county region live near their home ports. Fishermen in urban counties travel further to their ports than those in most rural counties. Over 40 percent of fishermen traveled seven or more miles from their homes to the ports they used in Escambia, Bay, Nassau and Duval Counties (Appendix Table 18). In two rural counties, Gulf and Franklin, only 27 percent and 7 percent, respectively, traveled seven miles or more from home to port. A larger percent of

Table 5.--Estimated number of vessels using ports, by type, length and draft, 1978.

County and port	Vessel	Length	Draft	Number using port during peak season
		----- Feet -----		
<u>Escambia</u>				
Pensacola	Shrimp	40-100	6-12	161
	Snapper-grouper	40-60	4-8	65
	Net and other	20-45	2-4	35
				<u>261</u>
<u>Bay</u>				
Panama City	Shrimp	40-100	6-12	116
	Snapper-grouper	40-60	4-8	60
	Net and other	30-63	3-4	40
				<u>216</u>
<u>Gulf</u>				
Port St. Joe	Shrimp	40-100	6-12	40
	Net and other	30-63	3-4	20
				<u>60</u>
<u>Franklin</u>				
Apalachicola	Shrimp	40-100	6-12	65
	Net and other	20-45	2-4	25
	Oyster	20-25	2-3	80
				<u>170</u>
Eastpoint	Oyster	20-27	2-3	100
Carrabelle	Shrimp	20-100	6-12	170
	Snapper-grouper	40-60	4-6	25
				<u>195</u>
<u>Wakulla</u>				
Panacea	Crab	20-25	2-3	100
	Net and other	20-35	2-3	50
	Shrimp	40-50	6-12	5
				<u>155</u>
<u>Nassau</u>				
Fernandina	Shrimp	40-100	6-12	15
Beach	Net and other	20-50	2-7	86
				<u>101</u>
<u>Duval</u>				
Mayport	Shrimp	40-100	6-12	70
	Snapper-grouper	40-60	4-8	30
	Net and other	20-50	2-7	252
				<u>352</u>
<u>Total</u>	Shrimp			642
	Snapper-grouper			180
	Net and other			508
	Oyster			180
	Crab			100
				<u>1,610</u>

Wakulla County fishermen traveled further. A total of 45 percent lived seven miles or more from their port (Appendix Table 18).

The majority of active fishermen responding to the mail survey fished within 25 miles of their port with a large proportion going less than ten miles offshore (Appendix Table 19). Over half of the fishermen responding to the questionnaire from Franklin, Nassau and Duval Counties fished less than ten miles offshore. Bay County, with 25 percent and Wakulla County with 29 percent, had the largest proportion of fishermen going more than 50 miles from port (Appendix Table 19).

These two groups of responses indicate that fishermen prefer to live near the port used but will travel 25 or even 50 miles from the port. The distance traveled is, of course, dependent primarily on the type of fishing. Location of any port facility is clearly important to both users' homes and to fishing grounds.

Most commercial fishermen responding to the mail survey sold less than 10,000 pounds of fish during 1976 (Appendix Table 20). However, a significant proportion, 14 to 23 percent in all counties except Wakulla, sold over 25,000 pounds of fish.

Fishermen producing shellfish tended to sell larger volumes than those catching fish. From one-third to one-half of shellfish operators in Escambia, Franklin, Wakulla and Nassau Counties sold over 25,000 pounds of shellfish (Appendix Table 21). Fishermen responding from Bay, Gulf and Duval Counties sold smaller quantities of shellfish. From 67 to 73 percent of those fishermen sold less than 10,000 pounds of shellfish (Appendix Table 21).

Marketing and Processing

A total of 109 fish and shellfish dealers and processors were listed by the National Marine Fisheries Service in the study area in 1975 (Table 6). Ninety-two firms were located in northwest Florida with Franklin County having the greatest number at 50 firms. With the exception of Franklin and Wakulla Counties, one-half or less of the total number of firms are considered to be processors. The exceptions are because of considerable blue crab and oyster processing in Franklin and Wakulla Counties. Very little other processing takes place in the area. Most shrimp are shipped in the green headless product form from fish houses to secondary buyers and fish are generally shipped to fresh fish markets.

Table 6.--Number of fish and shellfish dealers and processors by county, 1975.

Area and county	Total firms	Firms processing fishery products
Northwest Florida		
Escambia	11	4
Bay	13	7
Gulf	6	4
Franklin	50	47
Wakulla	12	12
	—	—
Total	92	72
Northeast Florida		
Nassau	7	3
Duval	10	3
	—	—
Total	17	6
	—	—
Total	109	79

Twenty nine percent of the 109 dealers in the seven major counties responded to the mail survey. Twenty seven of the 32 respondents were from the five northwest Florida counties (Table 7). These 27 represented 29 percent of all dealers in the area. Eighteen of the 27 handled fish and 22 handled shellfish. Fish dealers in the Northwest were almost equally divided between smaller-volume firms (under 100,000 pounds per year) and larger firms handling more than 100,000 pounds annually. More shellfish dealers were in the smaller volume category (Table 7).

Of the five dealers in the two northeastern counties who responded to the survey, all handled fish with three having over 100,000 pounds volume. Three shellfish dealers were also in the larger volume class in Nassau and Duval Counties (Table 7). For the seven-county region as a whole, 12 of 23 fish dealers and 14 of 26 shellfish dealers handled under 100,000 pounds.

A limited amount of basic research has been undertaken to describe and analyze the seafood marketing and processing activities in the study area. A 1972 study of the Florida shrimp processing industry (Alvarez, Andrew and Prochaska), concluded that 62 percent of shrimp leaving Florida

Table 7.--Classification of dealers responding in seven major counties by volume of fish and shellfish handled in 1976.

Area	Pounds handled				Total dealers responding ^b
	Fish		Shellfish		
	Under	Over	Under	Over	
	100,000	100,000	100,000	100,000	
	----- Number -----				
Northwest Florida ^a	10	8	13	9	27
Northeast Florida ^a	2	3	1	3	5
Total	12	11	14	12	32

^aAreas include counties shown in Table 6.

^bRow totals do not correspond to total responses because some dealers handle both fish and shellfish.

plants goes to foodservice markets with the remaining 38 percent to retail outlets. Consumption centers for Florida shrimp in the United States are fairly evenly distributed between the west (30 percent), the northeast (37 percent), and the southeast (33 percent). The only apparent difference between marketing in the study area of this report and in the statewide study is in the amount of processing done by firms included. Most shrimp marketing and processing activity in the study area consists of icing, boxing, freezing, storage, and transportation. Processing of breaded and specialty shrimp products is concentrated in the Tampa and Miami areas.

A 1978 telephone survey with fish handlers (grouper and red snapper) located in northwest Florida provided information on secondary market locations, product form, type of buyer and market outlet (Table 8). A large majority (90 percent) of the grouper are shipped to buyers in the southeastern United States. Red snapper, on the other hand, appear to have a wider market with 57 percent of sales by Florida fish dealers to buyers in the northeastern states, principally New York. Eighty-three percent of grouper sales and 58 percent of red snapper sales are made to other wholesalers. Restaurants directly receive seven percent

of the groupers sold by area fish dealers. For both species, fresh iced is the main product form. Ninety-nine percent of grouper and 96 percent of red snapper are sold in this form. Limited processing facilities are required to handle these species.

Table 8.--Product distribution from coastal fish dealers by market area, type of buyer and product form, northwest Florida grouper-snapper industry, 1977.^a

Item	Grouper	Red snapper
	----- <u>Percent</u> -----	
Market Area		
Southeast		
Florida	32	13
Alabama	25	13
Georgia	33	13
Total	90	44 ^b
Northeast U.S.	10	57
Total	100	100
Type of buyer		
Wholesaler	83	58
New York market agent	10	41
Restaurant	7	1
Total	100	100
Product form		
Fresh iced	99	96
Filletts	1	0 ^c
Frozen whole	0	4
Total	100	100

^aBased on a survey of coastal dealers handling 103,718 pounds of grouper and 1,544,371 pounds of red snapper in 1977.

^bIncludes 5 percent shipped to Louisiana buyers.

^cLess than one percent.

CHAPTER III

PORT FACILITIES AND SERVICES

Inadequate, deteriorated or unsuited port facilities can seriously hamper a region's fishing industry and retard or prevent growth. An important step in identifying fishing port needs in the seven counties studied was determining facilities available in each port, and how well those facilities serve the fishing industry. The mail survey described earlier asked fishermen and dealers to specify which facilities and services they used and to evaluate those facilities.

Port services were grouped into four categories shown in Table 9. The mail survey asked fishermen to indicate which facilities and services they used in their port and to rate each they used as satisfactory or needing improvement. Dealers were asked what facilities and services they provided as well as which they felt needed addition or improvement. These particular items were then discussed in more detail with industry members in personal interviews and port visits. Findings discussed below for each port include both mail survey and personal interview data.

Table 9.--Groups of facilities and services evaluated by port users in north Florida survey, 1977.

<u>Handling and processing</u>	<u>Docking and repair</u>
Shrimp unloading house	Docking facilities
Crab unloading house	Gear storage
Oyster house	Gear repair
Fish house	Gear supply
Processing unused fish	Electronics service
Freezer and cold storage	Engine repair
	Marine railway
<u>Supplies</u>	<u>Retail</u>
Bait sales	Restaurant
Ice plant	Retail seafood market
Fuel sales	Fishermens' meeting room
Groceries	

Members of the fishing industry identified several major problem areas. Docking, freezers and cold storage, ice supplies, and repair and supply services were identified in nearly all counties, along with certain specific needs in particular ports.

The approach taken in this study was one of developing the "package" or set of facilities and services that users of each port identified as most needed. These are summarized in Table 10. The particular items presented were developed in light of the needs and conditions in each area. Many problems or needs were common to all ports but each facility discussed was adapted to the requirements, physical conditions and particular situation of each port. Discussion of the "package" for each area follows the geographic order used in preceding chapters.

A special section ending this report summarizes the findings and recommendations of personnel of the Remote Sensing Applications Laboratory (RSAL) at the University of Florida. This RSAL report is based on interpretation of aerial photographs and satellite imagery and on information from a low-level aerial survey, from site visits and published data.

The RSAL report, included in its entirety here, is also published separately. Recommendations from the RSAL cover the ports in the five northwest Florida counties. Key points from the RSAL report are noted in the discussions of each of the northwest Florida port areas in Chapter III. More detail and aerial photographs and maps of the ports will be found in the RSAL section.

Escambia County

Current Facilities

Pensacola is the major seafood port in Escambia County and has the deepest harbor in the northwest region. Fishermen operating out of Pensacola indicated greatest use of fish houses, ice and fuel sales, and docking (Table 11). Several indicated they would use processing facilities for undertutilized fish, docking, gear supply and a meeting room if these facilities were improved or made available.

Of those facilities used by larger number of fishermen, ice supply, docking, and repair services were most in need of improvement (Table 12).

Table 10.--Fishing port facility needs in seven north Florida counties, 1978.

Facility or service	County and port								
	Escambia Pensacola	Bay Panama City	Gulf Port St. Joe	Apalach- icola	Franklin East- point	Carra- belle	Wakulla Panacea	Nassau Fernandina Beach	Duval May- port
Freezer	x			x					x
Cold storage				x					x
Bait supply							x		
Ice plant	x		x			x	x	x	
Docking	x	x	x	x	x	x	x	x	x
Gear storage	x	x	x	x		x	x	x	
Gear repair	x	x	x				x	x	
Electronics repair			x			x	x		
Diesel repair			x	x		x	x		
Marine railway		x	x			x			
Channel work				x			x		
Breakwater		x			x				

Table 11.--Current and projected use of seafood port facilities by commercial fishermen in Escambia County, 1977.

Facility	Currently using		Would use	
	<u>Number.</u>	<u>Percent</u>	<u>Number</u>	<u>Percent</u>
Shrimp house	8	17	2	4
Crab house	2	4	1	2
Oyster house	0	0	0	0
Fish house	34	76	1	2
Processing unused fish	3	6	8	17
Freezer, cold storage	12	26	2	4
Bait supply	12	26	1	2
Ice plant	22	70	1	2
Fuel sales	30	65	2	4
Groceries	10	22	3	6
Docking	24	52	5	11
Gear storage	7	15	0	0
Gear supply	14	30	4	11
Gear repair	10	22	2	4
Electronics repair	15	33	0	0
Diesel repair	17	37	1	2
Marine railway	14	30	2	4
Restaurant	8	17	2	4
Retail seafood market	10	22	1	2
Fishermens' meeting room	5	11	7	15
Total responses	46	--	46	--

Table 12.--Ratings of seafood port facilities by commercial fishermen in Escambia County, 1977.

	Rating facility	Fishermen	
		Saying needs improvement	Share
	Number	Number	Percent
Shrimp house	7	4	57
Crab house	1	0	0
Oyster house	0	0	0
Fish house	34	12	35
Processing unused fish	3	2	67
Freezer, cold storage	11	5	45
Bait supply	11	4	36
Ice plant	32	20	63
Fuel sales	29	10	34
Groceries	8	1	12
Docking	23	12	52
Gear storage	5	3	60
Gear supply	11	6	55
Gear repair	9	6	67
Electronics repair	15	6	40
Diesel repair	17	9	53
Marine railway	14	10	71
Restaurant	7	1	14
Retail seafood market	9	1	11
Fishermens' meeting room	4	2	50
Total responses	46		

For example, 63 percent of 37 fishermen rating ice facilities in the mail survey said those facilities needed improvement. Personal interviews substantiated this rating. The existing ice and fuel dock is old and the ice plant is frequently subject to breakdown. Only two dealers had ice plants, which they stated were inadequate for their own needs during heavy volume periods. Ice manufacturing and storage capacity in Pensacola is a serious limitation to commercial fishermen and dealers.

Lack of docking space is a particularly serious problem in Pensacola. Over one-half of the fishermen rating docks said improvement was needed. (Table 12). There are no public docks in the port area. Dealers provide a total of about 1,500 feet of dock space, mainly for unloading or berthing their own vessels.

Gear storage is a problem to a few fishermen. Three of the five rating this area said improvement was needed. Only one dealer offered a substantial amount of gear storage space. Six of the 11 fishermen rating gear supply service said that area needed improvement. Two gear supply firms interviewed indicated they stocked a limited assortment of marine hardware. They did not carry large specialized equipment such as winches, nets or large shrimp doors.

Electronic firms interviewed offer a wide range of equipment along with repair and installation. Name brand items offered included VHF and Citizens Band radios, automatic pilots, fathometers, radars, sonars, and LORAN receivers. Forty percent of the 15 fishermen rating electronics service indicated some aspects needed improvement.

The marine railway in Pensacola is a modern facility, able to handle boats of up to 1,000 tons and 175 feet in length. The boat yard can handle five boats at a time and offers repair services for wood, steel and fiberglass hulls. The boatyard also offers electronics and engine repair and provides complete machine shop and underwater repair services. However, this facility was rated by 71 percent of 14 fishermen as needing improvement. One reason for this rating may be the waiting time necessary to get a boat into the yard for repairs and the charges necessary for work done. Many fishermen stated a desire for a public or "rental" marine railway making possible lower cost hull work.

Net repair was another problem area indicated in Escambia County. Nets must be sent to Mobile, Alabama, or sometimes to Brownsville, Texas for repair. Engine repair was also felt to need improvement by over half the fishermen rating that service. This criticism may be directed more at costs of diesel repair rather than availability of the service.

Needed Facilities

Cost estimates were prepared for improvements in ice making and storage, fuel and ice docks, unloading and berthing docks, and gear storage space in the existing port area of Pensacola. It would appear that waterfront property is available in the municipally owned area near the present cargo port and fishing docks. Improvement and expansion of shore facilities support commercial fishing appear to be a logical part of the extensive redevelopment of that portion of the city of Pensacola. Estimates of

construction costs and annual revenue and expense for fishing port improvements are shown in Table 13.

Table 13.--Port facilities needed for commercial fishing, Pensacola, 1978.

Item	Description	Size	Cost per unit	Total cost
-----Dollars-----				
<u>Docks</u>				
Unloading	3740' x 20'	74,800 sq.ft.	22	1,645,600
Fuel and ice	250' x 10'	2,500 sq.ft.	20	50,000
Berthing	8380' x 10'	83,800 sq.ft.	20	<u>1,676,000</u>
Total docks				3,371,600
<u>Buildings</u>				
Ice plant				
Manufacturing	60 tons/day (watercooled)			123,000
Storage	150 tons			<u>34,000</u>
Total ice plant				157,000
Gear storage	2 buildings (40'x125')	10,000 sq.ft.	13	<u>130,000</u>
Total buildings				<u>287,000</u>
Total				3,658,600

(See Appendix C, Appendix Tables 22 and 23, for factors used in estimating facility requirements).

No estimates were prepared for added freezer capacity or gear repair and supply. Existing freezer capacity owned by dealers or available to the fishing industry is often inadequate. However, dealers and fishermen in Pensacola felt that new freezer facilities could not be justified for seafood and bait alone. This need, along with general freezer requirements, would determine if added commercial freezer space were economically justified. Private firms considering entering or adding to gear repair and supply business would also need to evaluate those needs. The facilities included in Table 13 are those appropriate for public investment or of general and pressing need for the whole fishing industry in Pensacola.

Most of the costs estimated for needed facilities are for docking. Docks and gear storage space, and possibly an ice plant, could be built with public funds from loans, grants or revenue bonds.

Estimated revenues from space rental for docks and gear storage were calculated along with a per unit revenue from fuel and ice sales. Operating expenses and capital costs were also calculated (Appendix Table 24.) It is estimated that total use the first year would be at 60 percent of capacity, with the second year at 80 percent capacity. Subsequent years are calculated at 100 percent of capacity use. "Capacity", however, is based on the number of vessels and pounds of landings currently in the port, and fuel and ice sales generated by that current level of activity. Factors used in these calculations are shown in Appendix Tables 22 and 23.

Projections of revenues, expenses and returns for the first five years of operation with improved facilities are shown in Table 14. It is assumed that revenues and expenses for the third, fourth and fifth years would be the same. Total capital recovery charges for construction would not be repaid by estimated revenues from space rentals and fuel and ice sales (Table 14). This is true for all facilities in each of the ports discussed. Financing arrangements and fund sources for improvements would need to be determined by concerned parties in each of the areas covered. Possible fund sources are discussed briefly in Chapter V of this report.

Table 14.--Estimated annual revenue, expense and return for port improvements, five-year projection, Pensacola.

Item	Year		
	1	2	3-5
	----- Dollars -----		
Total revenue	150,976	201,301	251,626
Total expense	588,698	607,098	625,498
Return (loss) Over expense	50,043	81,968	113,893
Total	(437,722)	(405,797)	(373,872)

Bay County

Current Facilities

Fishermen in Panama City use shrimp and fish houses, bait, ice, fuel and grocery sales, docking and supply and repair services heavily (Table 15).

Table 15.--Current and projected use of seafood port facilities by commercial fishermen in Bay County, 1977.

Facility	Fishermen			
	Currently using		Would use	
	Number	Percent	Number	Percent
Shrimp house	14	30	1	2
Crab house	0	0	2	4
Oyster house	5	11	4	8
Fish house	28	60	2	4
Processing unused fish	3	6	7	15
Freezer, cold storage	8	17	1	2
Bait supply	13	28	3	6
Ice plant	30	64	3	6
Fuel sales	32	68	2	4
Groceries	22	47	0	0
Docking	23	50	4	8
Gear storage	3	6	2	4
Gear supply	13	28	6	13
Gear repair	10	21	5	11
Electronics repair	16	34	0	0
Diesel repair	18	38	3	6
Marine railway	16	34	0	0
Restaurant	8	17	1	2
Retail seafood market	16	34	1	2
Fishermens' meeting room	6	13	3	6
Total responses	47	-	-	-

Fifteen percent of fishermen responding in the mail survey would use processing facilities for underutilized fish if they were available. Thirteen percent would use gear repair and 11 percent would use gear supply if those facilities were available or improved.

Panama City has large freezing and cold storage facilities. Total freezer capacity is 132,000 pounds per 24 hour period and storage for frozen product is approximately 2,350,000 pounds per cold storage volume for product held above freezing is about 30,000 pounds.

Ice-making and storage capacity in Panama City is also quite substantial. Dealers can provide 107 tons of ice daily and can store 372 tons. Physical capacity is not limiting but 44 percent of 27 fishermen indicated ice supply as a problem area. This rating could be due partly to the unusually hot summer of 1977 shortly before the mail questionnaires were sent.

Facilities and services receiving the greatest percentage of "need improvement" ratings from larger numbers of fishermen were docking and marine railway (Table 16). Fifty-three percent of 15 active commercial fishermen rated docking as needing improvement. Panama City docks open to commercial fishermen are nearly all public with total space of about 900 feet. This amount is less than adequate to handle the number of boats landing fish and shellfish in Panama City. Use of some of this docking area is also restricted by the weather at times. Alternative sites for additional docks are discussed in the RSAL report.

Gear repair needs were also reported by mail survey respondents. Marine railway and gear repair were not included in cost estimates since they are activities private firms would likely provide if opportunity were sufficient.

Cost estimates for Bay County additions and improvements are shown for docking and gear storage (Table 17). Revenues from improved facilities would provide a sizable annual income, exceeding \$272,000 in the third year of operation. Expenses are estimated to reach a total of more than \$497,000 by the third year (Appendix Table 25). Estimated revenues would more than cover all expenses except capital charges as in Pensacola (Table 18).

Gulf County

Current Facilities

A relatively small number of Gulf County fishermen responded to the mail survey. Only 12 of the estimated 41 in the county returned questionnaires. The largest number of fishermen used dock facilities (Table 19). Of those rating docks, 86 percent said improvement was needed (Table 20). Dock space is limited in Port St. Joe where about 1,800 feet are now available.

Large numbers of fishermen did not indicate needs for repair services in the mail survey (Table 20). However, personal interviews indicated that considerable improvement was needed. There are none or very limited services for gear, electronics and diesel repair, nor for repairs needing a marine railway. Gear storage is also a serious deficiency since fishing vessels require considerable storage space for nets and other gear. A large proportion of vessels using Port St. Joe are fishing boats (Table 5).

Table 16.--Ratings of seafood port facilities by commercial fishermen in Bay County, 1977.

Facility	Rating facility	Fishermen	Share
		Saying needs improvement	
	Number	Number	Percent
Shrimp house	12	5	42
Crab house	0	0	0
Oyster house	4	2	50
Fish house	25	9	36
Processing unused fish	8	5	67
Freezer, cold storage	6	2	33
Bait supply	11	2	18
Ice plant	27	12	44
Fuel sales	25	10	40
Groceries	16	2	12
Docking	15	8	53
Gear storage	3	1	33
Gear supply	12	4	33
Gear repair	9	4	44
Electronics repair	13	3	23
Diesel repair	14	4	29
Marine railway	13	7	54
Restaurant	7	2	29
Retail seafood market	12	2	17
Fishermens' meeting room	5	3	60
Total responses	47	-	-

Table 17.--Port facilities needed for commercial fishing, Panama City, 1978.

	Description	Size	Cost per unit	Total
	----Feet--	Square feet	----Dollars-----	Cost
<u>Docks</u>				
Unloading	3000 X 20	60,000	22	1,320,000
Berthing	7050 X 10	70,500	20	1,410,000
Total docks				2,730,000
<u>Buildings</u>				
Gear storage				
2 buildings	40 X 125	10,000	13	130,000
Total				2,860,000

(See Appendix C, Appendix tables 22 and 23, for factors used in estimating facility requirements.)

Table 18.--Estimated annual revenue, expense and return for port improvements, five year projection, Panama City.

Items	Year		
	1	2	3-5
	-----Dollars-----		
Total revenue	163,511	218,015	272,519
Total expense	465,345	481,445	497,545
Return (loss)			
Over expenses	79,461	117,865	156,269
Total	(301,834)	(263,430)	(225,026)

Table 19.--Current and projected use of seafood port facilities by fishermen in Gulf County, 1977.

Facility	Fishermen			
	Currently using		Would use	
	Number	Percent	Number	Percent
Shrimp house	5	42	1	8
Crab house	0	0	1	8
Oyster house	1	8	1	8
Fish house	3	25	1	8
Processing unused fish	1	8	3	25
Freezer, cold storage	1	8	3	25
Bait supply	2	17	2	17
Ice plant	3	25	3	25
Fuel sales	6	50	2	17
Groceries	2	17	1	8
Docking	7	58	0	0
Gear storage	2	17	3	25
Gear supply	1	8	3	25
Gear repair	2	17	3	25
Electronics repair	2	17	3	25
Diesel repair	2	17	3	25
Marine railway	2	17	3	25
Restaurant	0	0	2	17
Retail seafood market	1	8	3	25
Fishermens' meeting room	1	8	2	17
Total responses	12	-	12	-

Table 20.--Ratings of seafood port facilities by fishermen in Gulf County, 1977.

Facility	Fishermen		
	Rating	Saying needs improvement	Share
	Number	Number	Percent
Shrimp house	5	3	60
Crab house	0	0	0
Oyster house	1	0	0
Fish house	3	2	67
Processing unused fish	1	1	100
Freezer, cold storage	1	0	0
Bait supply	2	0	0
Ice plant	3	3	100
Fuel sales	6	2	33
Groceries	2	0	0
Docking	7	6	86
Gear storage	2	2	100
Gear supply	1	1	100
Gear repair	2	2	100
Electronics repair	2	2	100
Diesel repair	2	2	100
Marine railway	2	2	100
Restaurant	0	0	0
Retail seafood market	1	1	100
Fishermens' meeting room	1	1	100
Total responses	12	-	-

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Needed Facilities

Additional docks were the greatest need reported in Port St. Joe with an ice plant and gear storage also rated as important (Table 21). Available locations for docks and large port development possibilities are discussed in the RSAL report. Revenue from fuel sales would be the largest revenue category (Appendix Table 26) with total annual revenue in years three through five falling about \$70,000 short of total expenses (Table 22).

Table 21.--Port facilities needed for commercial fishing, Port St. Joe, 1978.

Item	Description	Size	Cost per	Total cost
			unit	
	<u>Feet</u>	<u>Square feet</u>	----- <u>Dollars</u> -----	
<u>Docks</u>				
Unloading	1175x20	23,500	22	517,000
Fuel & ice	250x10	2,500	20	50,000
Berthing	2100x10	21,000	20	<u>420,000</u>
Total docks				987,000
<u>Buildings</u>				
Ice plant				
Manufacturing	30 tons/day			65,000
Storage	75 tons			<u>17,000</u>
Total ice plants				82,000
Gear storage		12,500	13	<u>162,500</u>
Total buildings				<u>244,500</u>
Total				1,231,500

(See Appendix C, Appendix Tables 22 and 23, for factors used in estimating facility requirements).

All repair and supply facilities were listed as needed in Port St. Joe. However, these should be expected to be provided by private firms. Current numbers of boats and likely volume of business may not be large enough to attract additional repair or supply firms. However, a branch or part-time outlet for some services might be viable and would provide much-needed facilities for Gulf County fishermen.

Table 22.--Estimated annual revenue, expense and return for port improvements, five-year projection, Port St. Joe.

Items	Total		
	1	2	3-5
	-----Dollars-----		
Total revenue	80,621	107,494	134,368
Total expense	193,378	197,978	202,578
Return (loss) Over expenses	51,427	73,700	95,974
Total	(112,757)	(90,484)	(68,210)

Franklin County

Franklin County differs from the other six counties in this study by having three major ports. Apalachicola, Eastpoint and Carrabelle are all important landing areas with each landing a different combination of fish and shellfish. Apalachicola handles primarily shrimp and oysters, Eastpoint almost exclusively oysters, and Carrabelle mainly shrimp and fish.

Current Facilities

A total of 62 fishermen reported using the shore facilities in Franklin County (Table 23). Equal numbers used shrimp, oysters and fish houses, with about one-third in each case saying some improvements were needed (Table 24). These mail survey ratings and personal interviews in all three ports led to the judgment that there were no serious problems in handling and processing or supply facilities.

Docking and repair needs were substantial, however (Table 24). Of the 29 fishermen rating docks in the mail survey, 48 percent felt improvements were needed. These needs were most critical in Apalachicola and Carrabelle. Eastpoint, handling mostly oyster boats, has less need for dock space. Docks and unloading areas in Eastpoint are exposed to wind and wave action and many users said a breakwater or some protection was needed.

Table 23.--Current and projected use of seafood port facilities by commercial fishermen in Franklin County, 1977.

Facility	Fishermen			
	Currently using		Would use	
	Number	Percent	Number	Percent
Shrimp house	28	45	0	0
Crab house	7	11	1	2
Oyster house	28	45	0	0
Fish house	28	45	1	2
Processing unused fish	2	3	7	11
Freezer, cold storage	12	19	6	10
Bait supply	7	11	3	5
Ice plant	32	52	6	10
Fuel sales	34	55	1	2
Groceries	23	37	2	3
Docking	29	47	6	10
Gear storage	6	10	4	6
Gear supply	16	26	5	8
Gear repair	9	14	5	8
Electronics repair	10	16	6	10
Diesel repair	17	27	6	10
Marine railway	14	23	7	11
Restaurant	11	18	4	6
Retail seafood market	11	18	3	5
Fishermens' meeting room	3	5	10	16
Total responses	62	--	--	--

Table 24.--Ratings of seafood port facilities by commercial fishermen in Franklin County, 1977.

Facility	Fishermen		
	Rating	Saying needs improvement	Share
	Number	Number	Percent
Shrimp house	27	9	33
Crab house	5	2	40
Oyster house	27	9	33
Fish house	24	9	37
Processing unused fish	2	1	50
Freezer, cold storage	12	5	42
Bait supply	6	1	17
Ice plant	30	13	43
Fuel sales	31	10	32
Groceries	20	7	35
Docking	29	14	48
Gear storage	6	5	83
Gear supply	16	10	63
Gear repair	8	4	50
Electronics repair	10	6	60
Diesel repair	17	11	65
Marine railway	13	8	62
Restaurant	10	3	30
Retail seafood market	11	2	18
Fishermens' meeting room	3	3	100
Total responses	62	-	-

Seafood dealers in Apalachicola own most of the 1,800 feet of available dock space there. The same situation exists in Carrabelle where about 1,000 feet are available. There is a small public dock in Apalachicola but the basin is shallow and narrow and facilities are in poor condition.

Gear storage space is very limited in all Franklin County ports and gear supply and repair facilities are in need of improvement (Table 24). Electronics, diesel and boat repair services were also less than adequate.

Needed Facilities

Apalachicola

Docking and gear storage are the primary needs for improving shore facilities in Apalachicola (Table 25). Revenues from dock and gear storage

rental (Appendix Table 27) would cover most of the operating costs, excluding capital charge, for these facilities (Table 26).

Table 25.--Port facilities needed for commercial fishing, Apalachicola, 1978.

Item	Description	Size	Cost per unit	Total cost
	<u>Feet</u>	<u>Square feet</u>	<u>---Dollars---</u>	
<u>Docks</u>				
Unloading	1,200x20	24,000	22	528,000
Berthing	2,310x10	23,100	20	462,000
Total docks				990,000
<u>Buildings</u>				
Gear storage		9,000	13	117,000
Total buildings				117,000
Total				1,107,000

(See Appendix C, Appendix Tables 22 and 23, for factors used in estimating facility requirements).

Table 26.--Estimated annual revenue, expense and return, for port improvements, five year projection, Apalachicola.

Items	Year		
	1	2	3-5
	<u>-----Dollars-----</u>		
Total revenue	33,831	45,108	56,385
Total expense	194,543	205,583	216,623
Return (Loss) Over expense	(13,127)	(12,890)	(12,653)
Total	(160,712)	(160,475)	(160,238)

A major need in Apalachicola is dredging and maintenance of the channel used by fishing vessels. Additional dock space would likely require more dredging to provide a basin and dock area. Costs of these major improvements were not estimated since engineering studies of this work had been completed

and provided to local government bodies. Other sites and development possibilities are discussed in the RSAL report. Other needs may be filled by a local firm which began remodeling existing boat yard and repair facilities in the fall of 1977. This firm plans to provide all maintenance and repair services, as well as fuel and ice, and plans to freeze and process seafood. Many of the serious needs indicated by Franklin County fishermen in the mail survey and personal interviews will, no doubt, be provided by this firm as it reaches full operation.

Eastpoint

Oysters are the primary seafood product landed in Eastpoint. Oyster boats do not require nearly the amount of dock space nor shore facilities as shrimp or fishing boats. Only dock costs and rentals are estimated for Eastpoint (Table 27 and Appendix Table 28). Dock rental would provide about a fourth of the estimated total annual expense (Table 28). Along with docks, Eastpoint fishermen and dealers emphasized the need for a breakwater or some form of protection from wind and wave action for shore facilities.

Table 27.--Port facilities needed for commercial fishing, Eastpoint, 1978.

Item	Description	Size	Cost per unit	Total cost
	<u>Feet</u>	<u>Square feet</u>	----- <u>Dollars</u> -----	-----
<u>Docks</u>				
Unloading	750 X 20	15,000	22	330,000
Berthing	450 X 10	<u>4,500</u>	20	<u>90,000</u>
Total		19,500		420,000

(See Appendix C, Appendix tables 22 and 23, for factors used in estimating facility requirements).

Carrabelle

Sizeable investments would be required for facilities needed in Carrabelle (Table 29). As with other areas, the major part of estimated costs is for additional docks. Revenues would be sizeable (Appendix Table 29) but would not repay total costs (Table 30). All supply and repair

Table 28.--Estimated annual revenue, expense and return for port investments, five-year projections, Eastpoint.

Item	Year		
	1	2	3-5
	----- Dollars -----		
Total revenue	11,747	15,660	19,575
Total expenses	78,494	84,244	89,994
Return (loss) over expense	(10,755)	(12,590)	(14,425)
Total	(66,749)	(68,584)	(70,419)

facilities were reported as needed in Carrabelle (Table 10). Gear supply and electronics firms began operating there early in 1978 which may satisfy some of these needs.

Wakulla County

Current Facilities

Panacea is the port used by most Wakulla County fishermen though several land in St. Marks or Alligator Point and others use Franklin County ports. Twenty-three fishermen returned questionnaires with a sizeable number using shirmp and fish houses, ice and fuel sales, and docking and engine repair (Table 31). Facilities rated by one-third or more of the respondents as needing improvement were ice supplies, docking and engine repair (Table 32).

Personal interviews revealed that adequate supplies of fish scrap were not available in Panacea for use as crab bait. The long winding, shallow channel from the Gulf into Panacea is a major problem for many fishermen (Table 10). Dredging would be prohibitive, however, so costs were not estimated nor included in this report. See the RSAL report for additional discussion of these points.

Needed Facilities

Total facility costs for Panacea are substantially smaller than for other ports discussed. While dock space is needed and represents most of

the cost shown (Table 33), the blue crab boats predominant in Panacea do not require large docks. Costs for an ice plant and gear storage were also estimated along with revenue and expense (Appendix Table 30). Estimated revenue did not cover annual operating cost, and was considerably short of total cost (Table 34).

Repair and supply services were also needed according to Wakulla County fishermen. However, the volume of year round business may not be large enough to support a firm of each type. A branch, mobile or part-time outlet might be profitable.

The problem of inadequate local supplies of crab bait is difficult to approach. If more vessels landed fish in Panacea, with larger numbers being headed and gutted there, more bait would be available. However, the difficult channel and lack of many supporting facilities in Panacea keeps fishing boats from landing there. Thus, bait supplies are highly dependent on imports from other areas.

Table 29.--Port facilities needed for commercial fishing, Carrabelle, 1978.

Item	Description	Size	Cost per unit	Total cost
	<u>Feet</u>	<u>Square feet</u>	----- <u>Dollars</u> -----	
<u>Docks</u>				
Unloading	2,865 X 20	57,300	22	1,260,600
Fuel and ice	250 X 10	2,500	20	50,000
Berthing	5,890 X 10	58,900	20	1,178,000
Total docks				2,488,600
<u>Buildings</u>				
Ice plant				
Manufacturing	30 tons/day			82,000
Storage	75 tons			
Total ice plant				82,000
Gear storage		19,500	13	253,500
Total buildings				335,500
Total				2,824,100

(See Appendix C, Appendix Tables 22 and 23, for factors used in estimating facility requirements).

Table 30.--Estimated annual revenue, expense and return for port improvements, five-year projection, Carrabelle.

Items	Year		
	1	2	3-5
	-----Dollars-----		
Total revenue	109,671	146,228	182,785
Total expense	446,310	457,810	469,310
Return (Loss)			
Over expense	39,870	64,927	89,984
Total	(336,639)	(311,582)	(286,525)

Table 31.--Current and projected use of seafood port facilities by commercial fishermen in Wakulla County, 1977.

Facility	Fishermen			
	Currently using		would use	
	Number	Percent	Number	Percent
Shrimp house	9	39	2	9
Crab house	5	22	1	4
Oyster house	2	9	0	0
Fish house	12	52	1	4
Processing unused fish	3	13	2	9
Freezer, cold storage	2	9	4	17
Bait supply	7	30	2	9
Ice plant	12	52	3	13
Fuel sales	15	65	2	9
Groceries	9	39	0	0
Docking	12	52	2	9
Gear storage	1	4	1	4
Gear supply	5	22	3	13
Gear repair	6	26	1	4
Electronics repair	6	26	1	4
Engine repair	12	52	2	9
Marine railway	7	30	2	9
Restaurant	6	26	1	4
Retail seafood market	4	17	0	0
Fishermens' meeting room	0	0	3	13
Total responses	23	-	-	-

Table 32.--Ratings of seafood port facilities by commercial fishermen in Wakulla County, 1977.

Facility	Rating	Fishermen	
		Saying needs improvement	Share
	Number	Number	Percent
Shrimp house	8	2	25
Crab house	4	3	75
Oyster house	2	1	50
Fish house	9	3	33
Processing unused fish	3	2	67
Freezer, cold storage	1	0	0
Bait supply	5	4	80
Ice plant	9	5	56
Fuel sales	12	4	33
Groceries	6	1	17
Docking	12	6	50
Gear storage	1	0	0
Gear supply	4	2	50
Gear repair	6	3	50
Electronics repair	4	1	25
Engine repair	10	5	50
Marine railway	6	2	33
Restaurant	5	0	0
Retail seafood market	4	0	0
Fishermens' meeting room	0	0	0
Total responses	23	-	-

Table 33.--Port facilities needed for commercial fishing, Panacea, 1978.

Item	Description	Size	Cost per unit	Total cost
	Feet	Square feet	-----dollars-----	
<u>Docks</u>				
Unloading	700x20	14,000	22	308,000
Fuel and ice	250x10	2,500	20	50,000
Berthing	800x10	8,000	20	160,000
Total docks				518,000
<u>Buildings</u>				
Ice Plant				
Manufacturing	10 tons/day			28,000
Storage	25 tons			7,000
Total ice plants				35,000
Gear storage		3,000	13	39,000
Total buildings				74,000
Total				592,000

(See Appendix C, Appendix Tables 23 and 23, for factors used in estimating facility requirements).

Table 34.--Estimated annual revenue, expense and return for port improvements, five-year projection, Panacea.

Items	Year		
	1	2	3-5
	-----Dollars-----		
Total revenue	24,619	32,970	41,212
Total expenses	108,405	115,765	123,125
Return (loss) over expense	(4,861)	(3,870)	(2,988)
Total	(83,786)	(82,795)	(81,913)

Nassau County

Current Facilities

The primary port in Nassau County, Fernandina Beach, is somewhat better equipped than several ports previously discussed. This condition coupled with a decline in numbers of vessels and landings in Nassau County resulted in fewer needs being identified by fishermen and dealers.

From a total of 17 fishermen completing mail questionnaires, ten used shrimp houses, fuel sales and docks (Table 35). Seven to nine respondents used ice, bought groceries, and used gear supply, electronics and diesel repair and marine railway facilities.

Major needed improvements noted by fishermen in the survey were in shrimp houses, ice plant and docks (Table 36). No specific shortcomings in shrimp houses were identified in mail questionnaires or personal interviews, so it was not possible to determine why 50 percent of the fishermen rating shrimp houses said improvements were needed.

Needed Facilities

Some additional docks and ice capacity were needed in Fernandina Beach (Table 37). Some revenue would be generated (Appendix Table 31) but not enough to cover all costs (Table 38).

Gear storage, repair and supply were also needed in Nassau County but were not included in the analysis. With landings declining or static, the

number of fishermen operating out of Fernandina Beach has decreased. Additional supply and support firms might not be able to justify a full-time outlet there. The RSAL report did not include Fernandina Beach because no major dock needs were identified, nor were channel improvements needed.

Table 35.--Current and projected use of seafood port facilities by commercial fishermen in Nassau County, 1977.

Facility	Fishermen			
	Currently using		Would use	
	Number	Percent	Number	Percent
Shrimp house	10	59	0	0
Crab house	2	11	0	0
Oyster house	0	0	0	0
Fish house	3	18	0	0
Processing unused fish	1	6	1	6
Freezer, cold storage	0	0	2	12
Bait supply	1	6	0	0
Ice plant	8	47	2	12
Fuel sales	10	59	1	6
Groceries	9	53	0	0
Docking	10	59	0	0
Gear storage	0	0	0	0
Gear supply	7	41	0	0
Gear repair	5	29	0	0
Electronics repair	8	47	2	12
Diesel repair	9	53	1	6
Marine railway	9	53	0	0
Restaurant	5	29	0	0
Retail seafood market	3	18	0	0
Fishermens' meeting room	1	6	1	6
Total responses	17	-	-	-

Table 36.--Ratings of seafood port facilities by commercial fishermen in Nassau County, 1977.

Facility	Rating	Fishermen	
		Saying needs improvement	Share
	<u>Number</u>	<u>Number</u>	<u>Percent</u>
Shrimp house	10	5	50
Crab house	2	1	50
Oyster house	0	0	0
Fish house	2	1	50
Processing unused fish	1	0	0
Freezer, cold storage	0	0	0
Bait supply	1	0	0
Ice plant	8	4	50
Fuel sales	9	0	0
Groceries	8	0	0
Docking	10	6	60
Gear storage	0	0	0
Gear supply	6	0	0
Gear repair	3	0	0
Electronics repair	7	2	29
Diesel repair	8	1	12
Marine railway	8	2	25
Restaurant	4	0	0
Retail seafood market	3	1	33
Fishermens' meeting room	1	1	100
Total responses	17	-	---

Table 37.--Port facilities needed for commercial fishing, Fernandina Beach, 1978.

Item	Description	Size	Cost per unit	Total cost
	<u>Feet</u>	<u>Square feet</u>	----- <u>Dollars</u> -----	
<u>Docks</u>				
Unloading	770 X 20	15,400	22	338,800
Fuel and ice	250 X 10	2,500	20	50,000
Berthing	300 X 10	3,000	20	60,000
Total docks				448,800

Table 37.--Continued.

Item	Description	Size	Cost per unit	Total cost
	<u>Feet</u>	<u>Square feet</u>	----- <u>Dollars</u> -----	-----
<u>Buildings</u>				
Ice plant				
Manufacturing	12 tons/day			30,000
Storage	30 tons			<u>7,000</u>
Total ice plants				37,000
Gear storage		900	13	<u>11,700</u>
Total buildings				<u>48,700</u>
Total				497,500

(See Appendix C, Appendix Tables 22 and 23 for factors used in estimating facility requirements).

Table 38.--Estimated annual revenue, expense and return for port improvements, five-year projection, Fernandina Beach.

Item	Year		
	1	2	3-5
		<u>Dollars</u>	
Total revenue	22,228	29,637	37,046
Total expense	100,146	109,346	118,546
Return (loss) over expense	(11,591)	(13,382)	(15,173)
Total	(77,918)	(79,709)	(81,500)

Duval County

Current Facilities

Fishermen landing their catch in Duval County use Mayport or other areas near Jacksonville. Only Mayport is considered in the discussion of current

and needed facilities. Larger volumes of ocean fish and shrimp landings are handled through Mayport. Jacksonville landings are mainly river catch in smaller individual lots sold to small dealers. Many fishermen dock at other sites along the St. Johns River. Many of these are part-time operators with smaller boats and do not need extensive shore facilities.

Duval County fishermen primarily used shrimp and fish houses, supply facilities, and docking (Table 39). The main areas where larger number of fishermen indicated improvement was needed were in docking, repair and marine railway (Table 40).

Needed Facilities

Fishery resources off the northeast Florida Coast have suffered environmentally related setbacks the last few years. Consequently, fewer fishermen are using Duval County ports. Additional dock space in Mayport is the only improvement for which costs are estimated (Table 41). Revenues would be sizeable (Appendix Table 32) and more than adequate for costs other than capital recovery (Table 42).

Other needs in Duval County were for some added freezer and cold storage capacity in Mayport. This, of course, would be a private investment and might be difficult to justify unless landings increase.

Table 39.--Current and projected use of seafood port facilities by commercial fishermen in Duval County, 1977.

Facility	Fishermen			
	Currently using		Would use	
	Number	Percent	Number	Percent
Shrimp house	20	30	5	8
Crab house	4	6	4	6
Oyster house	2	3	1	2
Fish house	33	49	4	6
Processing unused fish	1	1	8	12
Freezer, cold storage	10	15	5	8
Bait supply	21	31	4	6
Ice plant	34	52	5	8
Fuel sales	36	54	4	6
Groceries	18	27	1	2

Table 39.--Continued.

Facility	Fishermen			
	Currently using		Would use	
	Number	Percent	Number	Percent
Docking	31	46	3	4
Gear storage	1	1	4	6
Gear supply	11	16	7	10
Gear repair	14	21	2	3
Electronics repair	16	24	4	6
Diesel repair	21	31	3	4
Marine railway	20	30	1	2
Restaurant	12	18	2	3
Retail seafood market	18	27	1	2
Fishermens' meeting room	6	9	7	10
Total responses	67	--	-	-

Table 40.--Ratings of seafood port facilities by commercial fishermen in Duval County.

Facility	Fishermen		
	Rating	Saying needs improvement	Share
	Number	Number	Percent
Shrimp house	13	4	28
Crab house	4	0	0
Oyster house	2	1	50
Fish house	30	5	17
Processing unused fish	1	0	0
Freezer, cold storage	7	4	57
Bait supply	20	4	20
Ice plant	33	12	36
Fuel sales	33	8	24
Groceries	17	2	12
Docking	30	17	57
Gear storage	1	1	100
Gear supply	10	1	10
Gear repair	14	4	29
Electronics repair	16	10	63
Diesel repair	19	7	37
Marine railway	16	9	56
Restaurant	11	1	9
Retail seafood market	16	4	25
Fishermens' meeting room	6	0	0
Total responses	67	-	--

Table 41.--Port facilities needed for commercial fishing, Mayport, 1978.

Item	Description	Size	Cost per unit	Total cost
	<u>Feet</u>	<u>Square feet</u>	<u>Dollars</u>	
<u>Docks</u>				
Unloading	2,465 X 20	49,300	22	1,084,600
Berthing	3,930 X 10	39,300	20	786,000
Total		88,600		1,870,600

(See Appendix C, Appendix Tables 22 and 23 for factors used in estimating facility requirements).

Table 42.--Estimated annual revenue, expense and return statement for port improvements, five-year projection, Mayport.

Item	Year		
	1	2	3-5
	<u>Dollars</u>		
Total revenue	84,145	112,193	140,241
Total expense	309,291	321,481	333,671
Return (loss) over expense	24,192	40,050	55,908
Total	(225,146)	(209,288)	(193,430)

Summary of Improvements Needed

Total estimated cost for all facilities needed in all seven counties is slightly over \$15 million. Docks account for the bulk of this cost at \$13.8 million or about 92 percent of the total. Ice plants represent 3 percent and gear storage 6 percent of the total estimated cost (Table 43). Estimated revenues from space rentals and sales of fuel and ice are sizable in five of the nine ports. Expected annual revenues in the third through fifth years of operation of improved facilities exceed \$100,000 in Port St. Joe, Carrabelle and Mayport (Table 44). Estimated annual revenues are over

\$250,000 in Pensacola and Panama City. Expected annual revenues ranged from over \$50,000 to under \$20,000 in Apalachicola, Eastpoint, Panacea and Fernandina Beach (Table 44).

Estimated revenues in those four ports did not cover operating expenses (Table 45). Revenue did exceed operating expenses in the other five ports, however. None of the ports showed enough revenue to cover operating expenses and capital costs. The smallest annual deficit estimated was about \$68,000 in Port St. Joe, while the largest was nearly \$374,000 in Pensacola (Table 45).

The capital costs reflect the amount of construction required to provide docks and other facilities needed by the commercial fishing industry. No cost estimates were made for buildings or other investment by private firms. However, needs for such facilities and services as bait supply, gear, electronics and engine repair and marine railways were identified in many of the ports. Some firms have, in fact, begun or expanded into some of the business lines most needed in a few areas during the time this study was conducted.

Another area where costs were not estimated was in liquid and solid waste disposal from dealers' fish houses. Relatively few large dealers replied to the mail survey, and those dealers who did respond either did little processing or apparently were not aware of waste disposal requirements that may be imposed in the future.

Table 43.--Total estimated costs of needed port facilities, nine north Florida ports, 1978.

Port	Facilities			Total cost
	Dock	Ice plant	Gear storage	
	----- 1,000 dollars -----			
Pensacola	3,371.6	157.0	130.0	3,658.6
Panama City	2,730.0	-----	130.0	2,860.0
Port St. Joe	987.0	82.0	162.5	1,321.5
Apalachicola	990.0	-----	-----	420.0
Carrabelle	2,488.6	82.0	253.5	2,824.1
Panacea	518.0	35.0	39.0	592.0
Fernandina Beach	448.8	37.0	11.7	497.5
Mayport	1,870.6	-----	-----	1,870.6
Total	13,824.6	393.0	843.7	15,061.3

Table 44.--Estimated revenue from improved facilities, third through fifth years, nine north Florida ports.

Port	Space rental	Sales	Total
	----- Dollars -----		
Pensacola	184,450	67,176	251,626
Panama City	153,175	119,344	272,519
Port St. Joe	54,500	79,868	134,368
Apalachicola	56,385	-----	56,385
Eastpoint	19,575	-----	19,575
Carrabelle	138,885	43,900	182,785
Panacea	24,600	16,612	41,212
Fernandina Beach	18,270	18,776	37,046
Mayport	97,425	42,816	140,241

Table 45.--Summary of annual revenue, expense and return, third through fifth years, improved facilities in nine north Florida ports.

Port	Revenue	Return (loss)	
		Over expense	Total
	----- Dollars -----		
Pensacola	251,626	113,893	(373,872)
Panama City	272,519	156,269	(225,026)
Port St. Joe	134,368	95,974	(68,210)
Apalachicola	56,385	(12,653)	(160,238)
Eastpoint	19,575	(14,425)	(70,419)
Carrabelle	182,785	84,984	(286,525)
Panacea	41,212	(2,988)	(81,913)
Fernandina Beach	37,046	(15,173)	(81,500)
Mayport	140,241	55,908	(193,430)

CHAPTER IV

FUTURE POSSIBILITIES IN RESOURCES AND PORT DEVELOPMENT

Underutilized Resources

Growth in the fishing industry in these seven counties will depend on development of species which are currently underutilized or unutilized. As evidenced from landings patterns for the major food species of fish, very little growth has occurred in landings. Major species such as shrimp, red snapper and grouper are currently under intensive fishing pressure and large increases in landings cannot be expected to occur.² United States shrimp fishermen will not be allowed to fish in Mexico after 1980. Since shrimp are an annual crop, this means more vessels will be fishing for the same approximate standing stock of shrimp each year. Any growth in these major species in northwest Florida will occur only from encouraging fishermen to divert their landings from other ports.

Stocks such as Spanish and king mackerel, black mullet and spotted sea trout may have the ability to withstand more fishing pressure. However, increased recreational fishing pressure on the mackerel and inshore fish such as spotted sea trout may slow growth in commercial utilization of these species. Blue crabs and oysters as well as many of the major species of inshore fish are dependent during part or all of their life cycles on the quality of estuarine waters. Residential and commercial development along the coast may also impede growth in the utilization of these species.

Major growth should occur in the development of some underutilized finfish resources. Some of this growth is demonstrated in increased landings of cigarfish, blue runner, ladyfish, jack crevalle and similar

² More precise estimates on growth potential of these species should be forthcoming in late 1978 and early 1979 from Fishery Management Plans being developed under authority of the Fishery Conservation and Management Act of 1976.

species, particularly in Bay and Gulf Counties. The National Marine Fisheries Service has made estimates of the potential production from catches currently underutilized in the southeast (Table 46).

Table 46.--Potential fishery resources in the southeastern U.S.

Fishery	Potential production
	<u>Million pounds</u>
Trawl bottomfish	3,400
Coastal pelagics	5,800
Mullet	150
Squid	20
Spanish mackerel	75
Inshore sharks	50
Bonita/little tuna	10
Dolphin/amberjacks	5
Slope invertebrates	3
Total	9,513

Source: Gulf and South Atlantic Fisheries Development Foundation, Inc., A Program for the Development of Underutilized Demersal and Pelagic Finfish Resources of the Southeast, 1978.

In general, waters of the Gulf of Mexico and South Atlantic support several important fisheries. Groundfish, excluding menhaden, constitute the second largest resource in the Southeast. There are about 175 species, of which the sciaenids (croaker, spot, drums and sea trouts) are the most important. They constitute about 98 percent of the industrial groundfish and foodfish, as well as most of the finfish discard of the shrimp fleet. Some are used for fish meal and pet food production. The most productive area is from Pensacola, Florida to Galveston, Texas. Including catch by anglers and fish discards, the total ground fish resource may approach 970,000 metric tons in the Gulf of Mexico.

Coastal pelagics constitute equally important stocks that are currently underutilized. These resources are associated with an off-bottom environment, as opposed to groundfish. There are about 11 major species of coastal

pelagic fish found in the southeast. These are scaled sardines, Spanish sardines, round herring, silver anchovy, butterfish, chub mackerel, bumper, rough scad, round scad, thread herring, and little tuna. Unlike the groundfish, utilization of the coastal pelagic stocks (excluding menhaden) is minimal. The 1970 fishery statistics show a total coastal pelagic catch (butterfish and thread herring) of 2,600 metric tons valued at \$100,000. The potential standing stock is estimated at close to seven million metric tons. Landings during 1974 of selected species along the Florida west coast and the Gulf of Mexico further bear out the low level of utilization of these resources (Table 47). Total landings of only 2.5 million pounds of these underutilized species were reported along the Florida west coast in 1974.

Development of these resources hinges on two questions. First, what is the role of these species in the food chain or the "predator-prey" relationship and second, into what market and/or product form can they be introduced? Basic research is needed to answer the first question. The second must be answered through a planned program of product and market development. This should include among other things:

- Resource assessment
- Market description
- Product characteristic determination
- Storage evaluation and technology development
- Gear development
- Grading, sorting and handling technology development
- Domestic and foreign market concept testing
- Pilot plant design and establishment
- Transportation and distribution development
- Consumer acceptability tests
- Waste treatment development
- Economic evaluation

The Gulf and South Atlantic Fisheries Development Foundation has proposed a full scale research program designed to address these as well as other topics regarding the development of these resources.

Successful completion of this development program might alter recommendations about industrial seafood port development found in this report. This kind of development would require plants and equipment of a more sophisticated scale than are currently found in the Coastal Plains region of Florida. This type development, along with existing seafood uses, might make a "total" industrial seafood port quite feasible.

Table 47.--Landings and value of selected underutilized resources, 1974.

Species	Florida west coast		Gulf of Mexico		Total U.S.	
	Quantity	Value	Quantity	Value	Quantity	Value
	1,000 lbs	\$1,000	1,000 lbs	\$1,000	1,000 lbs	\$1,000
Amberjack	58	4	58	4	126	25
Bonita	99	8	99	8	19,022	2,538
Butterfish	---	---	---	---	3,995	979
Chub mackerel ^a	---	---	---	---	134	11
Dolphin ^b	70	17	70	17	176	132
Little tuna	---	---	---	---	48	12
Round scad ^c	725	110	725	110	725	110
Sharks	25	2	25	2	2,647	192
Spanish sardines	786	59	786	59	788	59
Squid	47	9	66	13	34,403	2,455
Thread herring	732	35	732	35	5,180	161
Total ^d	2,542	244	2,561	248	67,244	6,674

^aListed in (2) as "Pacific mackerel".

^bListed in (2) as "Dolphinfish".

^cListed in (2) as "Cigarfish".

^dNo landings of scaled sardine, round herring, silver anchovy, bumper or rough scad were reported.

Sources: (1) Gulf and South Atlantic Fisheries Development Foundation, Inc. A Program for the Development of Underutilized Demersal and Pelagic Finfish Resources of the Southeast. Tampa, Florida, 1978.

(2) U.S. National Marine Fisheries Service. Fishery Statistics of the United States. Washington: U.S. Government Printing Office, 1974.

A Major Seafood Port - Preliminary Analysis

This section presents preliminary analysis of one major seafood industrial port. Estimated cost of the port is \$24.4 million (Table 48). This cost figure is extremely large by Florida commercial fishing standards and should be regarded as preliminary. This preliminary analysis is presented as an illustration of facilities needed and costs involved if one major port area were developed "from the ground up" - a large fishing port where none existed before.

The port is assumed to service 600 vessels of various sizes and handle 20 million pounds of finfish, and 5 million pounds each of shrimp and blue crabs. The number of vessels of each size or size range estimated to be in port for unloading catch and normal docking and servicing were used to calculate channel and basin dimensions, dock space and other key facility needs (Appendix Table 33). The volume of catch and first-stage fresh or frozen handling requirements were also used to develop size and cost requirements for handling facilities (Appendix Table 34).

Only a few points will be made about cost and revenue estimates in this discussion. The first is that estimated facilities and costs can be divided into two categories - facilities developed and paid for by public agencies, and those built by private firms. Site preparation, docks and basic buildings in Table 48 seem appropriate for use of public funds. Storage, freezer, repair and supply facilities and the optional facilities shown are best suited for private capital, if such a port were developed.

Total initial cost for site preparation, docks and basic buildings is estimated at \$12.6 million. Estimated cost for buildings and facilities for private firms is \$8.9 million, with another \$2.9 million in optional facilities.

A second essential point is that a few items account for the bulk of the costs. Dredging, sewage treatment and docks represent most of the costs that might be covered by public funds. The majority of private investment is estimated to go for seafood dealers' buildings, the ice plant, gear repair and supply, and processing facilities, if any (Table 48). Substantial changes in the assumptions on which these costs were based would naturally change those cost estimates and thus total cost for the entire port.

Table 48.--Estimated size and initial construction cost of a seafood industrial port in Florida, 1978.

Item	Description	Size	Cost per unit	Total cost
-----Dollars-----				
<u>Site preparation and basic facilities</u>				
Dredge channel and basin	2,000'X2,025'X15'	2,250,000 cu. yds	0.80	1,800,000
Fill and grade	-----	242,000 cu. yds	1.50	363,000
Base and pave	-----	121,000 sq. yds	8.00	968,000
Water supply and distribution	2.25 mil. gal/da	-----	----	750,000
Pumpout, sewage treatment	-----	-----	----	1,500,000
Utilities connections, electrical, gas, telephone	-----	-----	----	500,000
Total site preparation				5,881,000
<u>Docks</u>				
Unloading	5,240'X20'	104,800 sq. ft	22.00	2,305,600
Fuel and ice	4,300'X10'	43,000 sq. ft	20.00	860,000
Berthing	13,050'X10'	130,500 sq. ft	20.00	2,610,000
Total docks				5,775,600
<u>Buildings</u>				
Basic buildings				
Gear storage	4 @ 100'X140'	56,000 sq. ft	13.00	728,000
Port authority office	100'X100'	10,000 sq. ft	25.00	250,000
Total basic buildings				978,000

Table 48.--Continued

Item	Description	Size	Cost per unit	Total cost
			-----	<u>Dollars</u> -----
Ice plant				
Manufacturing and storage	200 tons/day, 500 tons capacity	-----	----	1,000,000
Fuel storage and pumping	650,000 gal. capacity	-----	----	350,000
Storage and freezer facilities				
Dealers' houses	6 @ 100'X100'	60,000 sq. ft	35.00	2,100,000
Freezer	20'X25'X12'	500 sq. ft	100.00	50,000
Product storage				
Frozen	100'X120'X30'	12,000 sq. ft	55.00	660,000
Iced	50'X60'X12	3,000 sq. ft	30.00	90,000
Total storage and freezer facilities				<u>2,900,000</u>
Repair and supply facilities				
Gear and net repair shop	2 @ 150'X400'	120,000 sq. ft	20.00	2,400,000
Gear supply store	150'X300'	45,000 sq. ft	20.00	900,000
Electronic repair and supply	60'X100'	6,000 sq. ft	20.00	120,000
Boatyard	100'X150'	15,000 sq. ft	45.00	675,000
Engine repair shop	100'X200'	20,000 sq. ft	20.00	400,000
Total repair and supply				<u>4,495,000</u>

Table 48.--Continued

Item	Description	Size	Cost per unit	Total cost
			-----Dollars-----	
Grocery	60X100'	126,000 sq. ft.	25.00	150,000
Total buildings				9,873,000
<u>Optional facilities</u>				
Retail seafood market	50'X80'	4,000 sq. ft	25.00	100,000
Restaurant	50'X200'	10,000 sq. ft	25.00	250,000
Lounge and meeting room	60'X80'	4,800 sq. ft	25.00	120,000
Processing plants	2 @ 200'X200'	80,000 sq. ft	30.00	2,400,000
Total optional facilities				2,870,000
Total (all items)				24,399,600

The third and final point to be made about the major port estimate is that it can serve two purposes. The first is as a starting point for detailed engineering analysis of a major port development if desired and second, as a comparison with investments for improvements at existing ports as outlined earlier in this report.

Revenues from the major port discussed here are estimated to be \$437,000 the first year, \$583,000 the second year and \$728,000 in the third through fifth years (Table 49). First and second year revenues are reduced to 60 percent and 80 percent of third year levels, since a new port would not likely reach peak activity for at least two years. While the revenues from space rental and fuel and ice sales are substantial, they do not cover operating costs nor capital charges (Table 50).

The size of investment necessary for this major port, the volume of catch and number of vessels handled, and the current status of Florida fisheries lead to the conclusion that such a port is not feasible. Existing ports can, with considerably less expenditure, handle the 600 vessels and 30 million pounds of catch assumed for one major new port. It is not likely that public funds would be available for an investment of the magnitude calculated, and private firms would certainly not provide funds for basin development or docks as well as for the private enterprises assumed in the analysis. Present marine resources would not provide 30 million pounds of fish, shrimp and crab in addition to that now being landed in North Florida nor would 600 boat owners move their vessels to a new port.

Nevertheless, the preliminary estimate discussed here can provide a comparison for improvements to existing ports and a starting point for any major port development in the future. A much smaller port, where key items were less costly than in this estimate, could possibly be feasible. Two areas included in this overall study, Gulf County and Franklin County, are possible sites for sizeable port development at some future time. Additional fishery resources, significant shifts in vessel numbers and local development of existing facilities will determine if larger port development would be feasible.

Table 49.--Estimated annual revenue for a seafood industrial port in north Florida, five-year projection.

Item	Amount	Unit cost per month	Year		
			1	2	3-5
----- Dollars -----					
Space rental					
Dock-unloading	5,240 ft.	1.00	37,728	50,304	62,880
Dock-berthing	13,050 ft.	1.00	70,470	93,960	117,450
Gear storage	560 ft.	1.00	2,688	3,584	4,480
Dealers' houses	600 ft.	1.00	4,320	5,760	7,200
Freezer	25 ft.	1.00	180	240	300
Product storage					
Frozen	120 ft.	1.00	864	1,152	1,440
Iced	60 ft.	1.00	432	576	720
Gear and net repair shop	800 ft.	1.00	5,760	7,680	9,600
Gear supply store	300 ft.	1.00	2,160	2,880	3,600
Electronic repair and supply	100 ft.	1.00	720	960	1,200
Boatyard	150 ft.	1.00	1,080	1,440	1,800
Engine repair shop	200 ft.	1.00	1,440	1,920	2,400
Grocery	100 ft.	1.00	720	960	1,200
Optional facilities					
Retail seafood market	80 ft.	1.00	576	768	960
Restaurant	200 ft.	1.00	1,440	1,920	2,400
Processing plant	400 ft.	1.00	2,880	3,840	4,800
Total space rental			133,458	177,944	222,430
Sales					
Ice	200 tons	.50/ton	15,600	20,800	26,000
Fuel	24,000,000 gal.	.02/gal.	288,000	384,000	480,000
Total sales			303,600	404,800	506,000
Total revenue			437,058	582,744	728,430

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Table 50.--Pro forma revenue and expense statement for a seafood industrial port in north Florida, five-year projection.

Item	Year		
	1	2	3-5
	----- Dollars -----		
Revenue			
Space rental	133,458	177,944	222,430
Sales	303,600	404,800	506,000
Total revenue	437,058	582,744	728,430
Expense			
Maintenance and repair	223,733	223,733	223,733
Administration	360,000	480,000	600,000
Utilities	54,000	72,000	90,000
Expense total	637,733	775,733	913,733
Capital charge	2,386,241	2,386,241	2,386,241
Total expense	3,023,974	3,161,974	3,299,974
Return (loss)			
Over expense	(200,675)	(192,989)	(185,303)
Total	(2,586,916)	(2,579,230)	(2,571,544)

CHAPTER V

REVIEW AND CONCLUSIONS

The Region and Its Fishery Resources

The seven Florida counties considered in this report contain the major fishing ports in the northern half of the state. Total 1976 landings of fish and shellfish were valued at \$22 million, provided by an estimated 1,034 boat owners and 1,610 boats. Fishing and directly related activities are major sources of income and employment in three of the seven counties, but relatively small economic sectors in the remaining four.

Trends in volumes of fish and shellfish landings have varied among the counties. All counties experienced increases from 1971 through 1973, with declines from 1973 to 1976. Escambia County landings in 1976 were about the same as in 1971, while landings in Bay and Gulf Counties were higher, especially for finfish. Shellfish volume increased in Franklin County while fish landings declined. Landings of fish and shellfish declined from 1971 through 1976 in the remaining counties of Wakulla, Nassau and Duval.

It is still too soon to determine the effects on these areas of the Fishery Conservation and Management Act of 1976, usually known as the "200-mile bill". This Act, which establishes U.S. control over fisheries up to 200 miles off shore, also requires management plans for major marine species. These plans are currently being developed for several species in the Gulf of Mexico which are of importance in the study area. Implementation of these plans and resulting fisheries development will undoubtedly have a substantial impact on Florida fishermen and dealers.

Added fishing effort and landings for species currently unutilized or underutilized could also change the fishing industry and ports in the seven counties covered. Primary effects would be on Gulf ports, although some underutilized species are also available in the Atlantic. No firm conclusions are possible at this time about the future of these species, since relatively little is known about gear, fishing techniques, costs or returns that might be realized.

Port Facilities

Shore facilities supporting commercial fishing in the seven counties are generally inadequate. Even in the northeast Florida counties of Nassau and Duval, where numbers of fishermen and landings volumes have declined, port facilities have many shortcomings. In Gulf ports where relatively large numbers of boats land sizable volumes, most port facilities and services are seriously inadequate.

Docks and gear storage facilities are needed in nearly all ports and some need channel improvement as well. These kinds of investments would most likely be best suited for public funds, while private firms would be most likely to establish or add to ice plants, bait and fuel facilities, and gear, electronics and engine supply and repair activities. Mail surveys and personal interviews with fishermen and dealers pointed out needs for facilities and services in the seven counties.

A "package" of needed facilities and services suitable for public investment was developed for each port, with costs, revenues and a pro forma balance (Tables 43-45). Ice plants were included in areas where needed because of the frequently severe shortages of ice during the year. Generally the estimated costs for docks were the greatest single item in each port. Total estimated costs for all facilities in all nine ports in the seven counties were in excess of \$15 million (Table 43). These costs do not include investments for private businesses that might be established.

Estimates of costs for a major industrial seafood port were also developed. This port, based on 600 vessels and 30 million pounds in landings, was estimated to cost \$24.4 million (Table 48). Public investments were \$12.6 million, with the remainder being private capital for handling and processing, services and repair and related businesses.

However, since expected revenues are not projected to cover even operating costs the "needs" may not be "economic needs".

Funding Sources for Port Development

A number of public agencies have funds for grants and loans for port development. Specific types, terms and conditions should be investigated with each agency. The sources will be discussed here only in general terms.

The Economic Development Administration of the U.S. Department of Commerce has provided funds for seafood port developments in North Carolina, Massachusetts, Alaska, as well as other northwestern and northeastern states. The Department of Housing and Urban Development would also be a source of funds, especially through the Community Development block grant program. Funds for fisheries cooperatives may be available from the Bank for Cooperatives, a part of the Farm Credit Service.

State agencies cooperate with all these Federal agencies, and are involved in most funding and development programs. Local groups interested in port development should contact the appropriate state agencies, and state offices of Federal agencies for information and assistance.

Conclusions

Commercial fishing is important in the seven counties studied. Improved shore facilities could stimulate and attract more fishermen and put Florida in a position to make greater use of many underutilized species of fish and shellfish. A single major industrial seafood port, built as a completely new development, is not feasible now. Improvements, many of them major, are needed in many existing Florida ports.

Expected revenues would cover operating costs in five of the nine ports. However, expected revenues would not pay operating expenses and repay capital construction costs in any of the ports. Charges for development and construction of docks and major facilities were calculated for full repayment of costs over 30 years with an annual interest rate of 10 percent. If grants or more favorable terms were available for facilities in a given port, improvements could be economically feasible.

APPENDIX A

Appendix Table 1. Employment and annual payroll in private business, seven Florida counties, 1975.

Sector	County							
	Escambia		Bay		Gulf		Franklin	
	Employees	Annual payroll	Employees	Annual payroll	Employees	Annual payroll	Employees	Annual payroll
	--\$1,000--		--\$1,000--		--\$1,000--		--\$1,000--	
Agricultural services, forestry, fisheries	223	1,389	659	5,955	10	----- ^b	16	200
Fishing, etc.	66	477	175	----- ^a	--- ^b	----- ^b	--- ^b	--- ^b
Mining	373	4,117	175	----- ^a	--- ^b	----- ^b	--- ^b	--- ^b
Contract construction	5,549	52,911	1,751	14,278	36	258	10	47
Manufacturing	11,017	132,616	3,183	35,121	647	13,175	170	874
Transportation and other public utilities	3,384	32,994	1,555	12,070	81	687	60	--- ^a
Wholesale trade	3,378	32,810	1,226	11,007	83	310	195	808
Retail trade	13,739	76,652	5,446	31,554	275	1,272	186	871
Finance, insurance and real estate	2,851	24,471	1,415	11,326	84	472	56	362
Services	10,763	74,050	3,622	21,313	158	978	66	286
Other	329	2,106	375	----- ^a	10	----- ^a	10	--- ^a

Appendix Table 1. Continued

Sector	County					
	Wakulla		Duval		Nassau	
	Employees	Annual payroll	Employees	Annual payroll	Employees	Annual payroll
		<u>\$1,000</u>		<u>\$1,000</u>		<u>\$1,000</u>
Agricultural services, forestry, fisheries	60	-----	749	5,255	56	452
Fishing, etc.	--- ^b	----- ^b	----- ^b	----- ^b	----- ^b	----- ^b
Mining	10	----- ^a	28	147	----- ^b	----- ^b
Contract construction	41	259	14,776	160,732	238	1,889
Manufacturing	442	4,690	26,144	269,419	2,715	34,707
Transportation and other public utilities	166	1,555	16,657	174,300	110	1,058
Wholesale trade	86	477	18,857	213,186	509	5,095
Retail trade	240	1,019	38,895	245,737	1,213	5,650
Finance, insurance and real estate	77	531	26,042	329,367	426	3,518
Services	107	827	43,636	320,939	568	2,238
Other	23	168	1,338	10,311	90	390

^aFigures withheld to avoid disclosure of operations.^bNot reported.

Source: Bureau of Business and Economic Research.

Appendix Table 2. Personal income on place-of-work basis, seven Florida counties, 1975.

County	Total labor and proprietors income	Farm income	Nonfarm					State and local
			Total	Private	Total	Government		
						Civilian	Federal	
							Military	
-----\$1,000-----								
Escambia	1,040,902	15,886	1,025,016	630,088	394,928	132,174	152,773	88,668
Bay	293,889	-289	294,178	182,463	111,715	32,721	43,043	35,951
Gulf	37,158	195	36,963	30,897	6,066	337	196	5,533
Franklin	12,138	-144	12,282	6,491	5,791	661	337	4,753
Wakulla	17,375	277	17,098	11,649	5,449	878	136	4,435
Nassau	95,761	7,787	87,974	60,718	27,256	14,458	645	12,153
Duval	2,734,397	9,609	2,724,788	2,087,686	637,102	171,469	208,428	257,205

Source: Bureau of Economic and Business Research.

Appendix Table 3.--Private nonfarm income by industrial class, seven Florida counties, 1975.

County	Total private nonfarm income	Manufacturing	Mining	Contract construction	Wholesale and retail trade	Finance, insurance, real estate	Transportation, communication, public utilities	Services	Other private industry
-----1,000 dollars-----									
Escambia	557,332	158,190	1,437	71,786	136,316	33,887	52,651	119,639	3,426
Bay	182,463	38,810	621	17,914	53,933	14,841	19,418	34,934	1,992
Gulf	30,897	----- ^a	----- ^a	4,791	2,424	555	4,694	1,391	----- ^a
Franklin	6,491	693	----- ^b	----- ^a	3,265	437	----- ^a	1,115	----- ^a
Wakulla	11,649	6,356	----- ^a	481	2,250	----- ^a	631	1,690	----- ^a
Nassau	60,718	33,127	----- ^a	2,340	10,572	4,258	3,035	----- ^a	----- ^a
Duval	2,087,686	302,227	1,202	193,070	571,132	284,581	264,930	463,270	7,274

^aFigures withheld to avoid disclosure of operations.

^bLess than \$50,000.

Source: Bureau of Economic and Business Research.

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Appendix Table 4. Population, Escambia and Bay Counties, 1940, 1950, 1960, 1970, 1976, projected 1980, 1990, 2000, and percent change.

Year	Escambia		Bay	
	Population	Change	Population	Change
	<u>1,000</u>	<u>Percent</u>	<u>1,000</u>	<u>Percent</u>
1940	74.7	--	20.7	--
1950	112.8	51	42.7	106
1960	173.8	54	67.1	57
1970	205.3	18	75.3	12
1976	225.8	10	92.9	23
Projected				
1980	240.1	6	99.5	7
1990	284.5	18	119.2	20
2000	329.4	16	138.1	16

Source: Bureau of Economic and Business Research.

Appendix Table 5. Population, Gulf, Franklin and Wakulla Counties, 1940, 1950, 1960, 1970, 1976, projected 1980, 1990, 2000, and percent change.

Year	Gulf		Franklin		Wakulla	
	Population	Change	Population	Change	Population	Change
	<u>1,000</u>	<u>Percent</u>	<u>1,000</u>	<u>Percent</u>	<u>1,000</u>	<u>Percent</u>
1940	7.0	--	6.0	--	5.5	--
1950	7.5	7	5.8	-3	5.3	-4
1960	9.9	33	6.6	13	5.3	0
1970	10.1	2	7.1	7	6.3	20
1976	10.9	8	7.9	12	8.7	38
Projected						
1980	11.3	4	8.6	8	10.4	19
1990	13.0	15	10.3	20	14.0	35
2000	15.0	15	12.0	16	16.2	16

Source: Bureau of Economic and Business Research.

Appendix Table 6. Population, Nassau and Duval Counties, 1940, 1950, 1960, 1970, 1976, projected 1980, 1990, 2000, and percent change.

Year	Nassau		Duval	
	Population	Change	Population	Change
	<u>1,000</u>	<u>Percent</u>	<u>1,000</u>	<u>Percent</u>
1940	10.8	--	210.0	--
1950	12.8	19	304.2	45
1960	17.2	34	455.4	50
1970	20.6	20	528.9	16
1976	30.6	49	579.7	10
Projected				
1980	37.1	21	608.9	5
1990	50.9	37	709.1	16
2000	59.0	16	821.0	16

Source: Bureau of Economic and Business Research.

Appendix Table 7. --Total landings of selected fish and shellfish species by months, Escambia County,
1971-1976.

Year	Month	Croaker	Grouper	Black mullet	Snapper	Spotted sea trout	Shrimp	Total fish	Total shellfish	Total
-----Pounds-----										
1971	January	61,517	2,164	32,344	20,374	3,364	42,542	175,046	55,194	230,240
	February	27,905	1,054	54,759	14,433	5,154	36,512	127,772	45,509	173,281
	March	40,848	2,123	56,885	11,461	3,399	52,882	149,172	64,467	213,639
	April	42,427	4,306	29,500	22,316	4,650	38,189	159,086	52,914	212,000
	May	50,986	12,162	25,765	25,505	9,996	50,771	223,638	74,644	298,282
	June	54,349	11,621	58,059	43,449	7,043	82,212	252,809	86,937	339,746
	July	74,583	9,558	27,893	35,593	4,315	120,175	220,097	122,976	343,073
	August	78,923	9,544	61,262	34,294	5,610	123,082	268,021	124,599	392,620
	September	58,521	3,231	44,165	19,401	5,738	101,370	181,166	103,090	284,256
	October	152,313	5,994	148,553	35,326	6,030	119,436	444,288	122,585	566,873
	November	63,271	3,894	192,553	32,344	4,800	104,054	355,942	105,538	461,480
	December	54,027	9,653	111,269	33,830	6,372	105,891	263,018	110,472	373,490
	Total	759,670	75,304	843,007	328,326	66,471	977,116	2,820,055	1,068,925	3,888,980

Appendix Table 7.--Continued.

Year	Month	Croaker	Grouper	Black mullet	Red snapper	Spotted sea trout	Shrimp	Total fish	Total shellfish	Total
-----Pounds-----										
1972	January	92,738	9,269	87,841	27,370	3,792	41,103	279,483	46,896	326,379
	February	129,110	7,765	85,060	24,961	7,068	51,852	326,062	58,319	384,381
	March	72,991	6,272	91,251	25,750	10,188	63,659	272,687	74,416	347,103
	April	49,216	9,297	50,121	30,947	8,463	63,274	181,259	77,055	258,314
	May	86,526	14,082	53,158	35,388	4,636	71,217	247,805	78,340	326,145
	June	104,420	13,099	47,180	38,048	4,613	57,076	247,788	59,783	307,571
	July	111,247	22,200	28,192	46,755	3,199	120,742	251,815	123,488	375,303
	August	112,010	25,860	87,745	60,845	2,931	156,730	343,422	159,812	503,234
	September	163,015	9,809	94,053	51,121	5,779	89,955	375,076	91,747	466,823
	October	215,448	4,623	174,447	70,113	9,716	36,262	586,906	37,599	624,505
	November	132,487	2,298	123,478	64,046	6,428	125,898	458,342	128,162	586,504
	December	121,914	6,225	90,130	65,803	5,271	59,368	360,746	64,976	425,722
	Total	1,391,122	130,799	1,012,656	541,147	72,084	873,477	3,931,391	1,000,593	4,931,984

Appendix Table 7.--Continued.

Year	Month	Croaker	Grouper	Black mullet	Red snapper	Spotted sea trout	Shrimp	Total fish	Total shellfish	Total
-----Pounds-----										
1973	January	123,924	4,565	81,027	46,544	6,102	26,669	321,710	34,548	356,258
	February	127,751	4,861	91,115	49,478	3,201	51,839	332,529	57,769	390,298
	March	71,312	7,014	45,992	41,136	3,284	83,219	208,186	91,462	299,648
	April	104,645	9,745	53,429	27,890	8,620	62,821	278,368	83,787	362,155
	May	129,453	12,601	41,715	73,438	13,737	97,703	335,404	115,193	450,597
	June	220,593	13,569	51,228	69,520	11,385	80,270	423,473	89,214	512,687
	July	286,254	7,924	65,401	39,869	8,266	106,024	484,849	110,429	595,278
	August	366,556	15,100	72,843	44,505	8,176	55,628	620,556	60,876	681,432
	September	168,100	6,627	93,997	37,726	4,733	48,134	392,575	49,967	442,542
	October	153,283	7,714	151,159	51,437	6,300	96,816	509,151	98,754	607,905
	November	83,092	5,462	96,708	54,312	6,310	96,747	394,686	98,911	493,597
	December	119,957	4,783	76,050	39,066	9,414	100,263	347,807	104,539	452,346
	Total	1,954,920	99,965	920,664	574,921	89,528	906,133	4,649,294	995,449	5,644,743

Appendix Table 7. --Continued.

Year	Month	Croaker	Grouper	Black mullet	Red snapper	Spotted sea trout	Shrimp	Total fish	Total shellfish	Total
-----Pounds-----										
1974	January	116,669	5,478	61,621	40,731	7,880	57,468	295,503	61,985	357,488
	February	105,657	4,127	40,125	38,178	6,444	84,417	234,911	96,730	331,641
	March	145,101	3,842	39,731	21,145	6,207	93,172	242,350	103,254	345,604
	April	66,959	5,904	37,991	23,987	7,044	54,869	330,299	81,804	412,103
	May	122,650	13,792	45,367	51,342	7,654	54,881	289,696	62,031	351,727
	June	110,268	8,834	56,999	45,980	7,954	66,820	262,838	67,872	330,710
	July	149,609	10,215	58,077	59,009	6,001	130,799	352,693	132,444	485,137
	August	126,672	5,751	73,726	58,878	5,990	116,001	350,546	116,876	467,422
	September	125,317	3,020	89,166	52,155	6,860	88,453	344,289	90,141	434,430
	October	106,394	2,648	145,279	60,544	4,708	98,329	468,960	99,361	568,321
	November	113,117	3,612	154,620	43,735	7,498	76,120	443,161	77,917	521,078
	December	115,629	3,259	56,041	46,934	9,167	63,318	310,116	65,312	375,428
	Total	1,404,042	70,482	858,743	542,612	83,407	984,647	3,925,362	1,055,727	4,981,089

Appendix Table 7.--Continued.

Year	Month	Croaker	Grouper	Black mullet	Red snapper	Spotted sea trout	Shrimp	Total fish	Total shellfish	Total
-----Pounds-----										
1975	January	120,761	5,837	36,627	38,405	8,538	41,342	253,999	46,050	300,049
	February	91,648	4,519	49,560	31,993	11,362	46,602	218,698	50,826	269,524
	March	94,370	4,823	35,871	30,843	6,901	77,040	209,589	87,097	296,686
	April	113,139	4,330	42,837	27,574	10,180	76,443	330,833	95,241	426,074
	May	119,824	15,222	46,487	52,179	14,816	66,870	324,585	79,677	404,262
	June	147,575	8,990	45,029	33,472	8,350	73,642	320,356	82,028	402,384
	July	151,878	10,483	88,901	32,039	10,130	117,842	367,092	126,516	493,608
	August	240,403	7,947	89,774	46,563	11,138	143,455	493,629	145,729	639,358
	September	122,763	4,951	69,718	24,328	13,842	101,549	302,154	102,127	404,281
	October	64,223	9,611	159,879	64,557	10,982	81,357	528,244	81,857	610,101
	November	16,395	3,811	73,259	31,338	5,924	71,403	167,841	71,889	239,730
	December	41,566	5,852	48,283	43,796	10,100	99,790	208,541	100,695	309,236
	Total	1,242,545	86,376	786,225	457,087	122,263	997,335	3,725,561	1,069,732	4,795,293

Appendix Table 7.--Continued.

Year	Month	Croaker	Grouper	Black mullet	Red snapper	Spotted sea trout	Shrimp	Total fish	Total shellfish	Total
-----Pounds-----										
1976	January	104,972	4,106	49,902	33,251	13,307	30,875	266,001	31,200	297,201
	February	60,792	8,296	33,083	42,486	10,794	68,228	193,522	69,564	263,086
	March	36,351	4,889	24,771	23,862	5,870	43,288	138,983	45,757	184,740
	April	25,768	7,512	39,921	32,301	11,564	60,512	264,463	70,234	334,697
	May	14,991	8,190	23,063	33,618	9,263	66,401	255,974	74,091	300,065
	June	17,598	18,988	31,886	43,537	9,537	120,666	200,899	123,113	324,012
	July	13,011	39,075	76,202	28,613	5,100	126,984	221,584	132,382	353,966
	August	36,763	19,333	82,701	15,909	6,885	142,779	215,162	148,581	363,743
	September	34,032	11,194	93,031	20,527	5,662	119,105	225,507	121,452	346,959
	October	45,193	3,102	132,061	21,946	3,844	96,974	265,734	98,987	364,721
	November	25,170	5,014	174,445	32,152	10,935	114,522	288,758	116,204	404,962
	December	22,585	5,351	63,504	43,649	8,304	36,783	177,711	39,763	217,474
	Total	437,226	135,050	824,570	371,851	101,065	1,027,117	2,684,298	1,071,328	3,755,626

Source: Florida Landings, monthly issues. U.S. Department of Commerce.

Appendix Table 8. --Total landings of selected fish and shellfish species by months, Bay County, 1971-1976.

Year	Month	Grouper	Black mullet	Red snapper	Spanish mackerel	Blue runner	Cigarfish	Thread herring	Ladyfish
-----Pounds-----									
1971	January	14,637	36,580	80,342	570	0	0	0	0
	February	11,953	18,991	40,856	247	0	0	0	0
	March	21,919	22,158	99,974	538	0	0	0	0
	April	35,306	7,087	49,781	147,637	0	123,223	3,753	0
	May	34,832	10,241	85,626	50,129	384,575	28,826	9,875	95,108
	June	38,337	18,404	91,689	915	124,522	27,630	41,120	57,365
	July	19,021	21,245	94,389	547	6,830	5,687	8,780	17,875
	August	37,019	40,195	98,984	1,977	279,556	9,744	23,265	12,016
	September	9,983	60,686	102,589	223,357	80,602	9,805	5,721	40,356
	October	12,272	138,918	141,309	172,805	2,075	16,612	26,174	52,820
	November	11,087	200,929	72,039	51,037	0	4,340	600	0
	December	14,092	23,321	77,743	4,523	0	0	0	0
	Total	260,458	598,755	1,034,521	654,182	878,160	225,867	119,288	275,540

Appendix Table 8.--Continued.

Year	Month	Menhaden	Jack crevalle	Shrimp	Oysters	Total fish	Total shellfish	Total
-----Pounds-----								
1971	January	68	0	23,793	6,035	166,065	29,828	195,893
	February	0	0	23,261	15,247	106,588	38,508	145,096
	March	325	0	20,797	7,031	168,371	28,566	196,937
	April	3,890	0	58,558	2,181	473,569	64,062	537,631
	May	0	0	100,133	4,519	792,113	109,308	901,421
	June	10,825	0	100,231	0	545,617	104,751	650,368
	July	10,075	0	130,701	0	267,682	136,924	404,606
	August	0	0	110,877	0	595,464	120,113	715,577
	September	7,350	0	66,896	1,828	638,747	77,197	715,944
	October	0	0	108,313	3,968	646,401	112,623	759,024
	November	0	0	108,293	5,792	383,091	117,391	500,482
	December	0	0	81,995	8,825	160,202	93,013	253,215
	Total	32,533	0	933,848	54,426	4,943,910	1,032,284	5,976,194

Appendix Table 8.--Continued.

Year	Month	Grouper	Black mullet	Red snapper	Spanish mackerel	Blue runner	Cigarfish	Thread herring	Ladyfish
-----Pounds-----									
1972	January	10,858	29,362	15,407	2,775	0	0	0	0
	February	12,503	45,638	48,086	1,925	0	0	0	0
	March	20,314	24,755	48,952	93,898	0	0	0	0
	April	25,437	4,415	47,115	218,729	35,700	41,622	0	11,750
	May	36,868	10,440	84,397	26,001	519,059	55,280	5,880	140
	June	121,955	23,359	128,938	0	146,509	52,355	4,930	0
	July	192,392	196,742	166,057	2,872	94,006	38,284	54,102	12,449
	August	143,370	46,863	92,705	19,142	135,059	17,500	64,570	3,465
	September	54,559	50,679	59,109	245,318	147,076	6,560	10,500	38,060
	October	56,369	122,061	43,884	252,302	6,854	1,219	1,075	23,520
	November	25,936	203,257	194,847	94,011	0	2,565	0	0
	December	29,287	85,369	252,302	0	0	0	0	0
	Total	729,848	842,940	1,181,799	956,973	1,084,263	215,485	141,057	89,384

Appendix Table 8.--Continued.

Year	Month	Menhaden	Jack crevalle	Shrimp	Oysters	Total fish	Total shellfish	Total
-----Pounds-----								
1972	January	4,700	78	49,485	6,228	105,879	56,874	162,753
	February	4,700	0	48,388	10,186	159,228	61,313	220,541
	March	1,250	0	83,903	7,236	207,902	102,870	310,772
	April	590	0	140,821	11,804	427,454	160,627	588,081
	May	2,215	100	150,413	5,382	763,607	171,589	935,196
	June	180	300	99,480	0	511,643	112,195	623,838
	July	17,456	17,274	133,181	0	841,446	152,412	993,858
	August	30,064	6,680	168,378	0	627,616	197,978	825,594
	September	0	2,126	119,361	4,919	658,839	141,603	800,442
	October	20,578	32,694	105,985	7,963	607,048	124,846	731,894
	November	9,122	99,264	127,182	9,250	656,923	142,185	799,108
	December	320	0	87,956	15,443	450,415	103,553	553,968
	Total	91,175	158,516	1,314,533	78,411	6,018,000	1,528,045	7,546,045

Appendix Table 8.--Continued.

Year	Month	Grouper	Black mullet	Red snapper	Spanish mackerel	Blue runner	Cigarfish	Thread herring	Ladyfish
		<u>Pounds</u>							
1973	January	6,240	63,262	69,432	0	0	0	0	0
	February	18,151	21,777	127,401	0	0	0	0	0
	March	13,885	12,617	125,428	6,962	0	0	0	0
	April	22,805	14,462	125,757	8,296	0	0	0	200
	May	43,833	19,686	194,480	19,287	404,826	19,555	35,221	55,321
	June	42,546	23,323	198,791	1,697	85,018	127,169	55,657	29,763
	July	37,015	32,674	214,792	985	54,782	59,264	121,668	15,093
	August	20,024	41,302	184,845	30,549	124,236	5,138	9,800	30,193
	September	15,402	37,705	185,743	71,109	51,440	800	31,850	82,497
	October	16,280	159,297	222,372	120,941	11,862	6,555	21,720	245,703
	November	15,106	185,104	160,543	106,981	407	860	3,700	52,244
	December	13,149	35,105	187,955	1,146	0	0	0	0
	Total	264,436	646,314	1,997,539	367,953	732,571	219,341	279,616	511,014

Appendix Table 8.--Continued.

Year	Month	Menhaden	Jack crevalle	Shrimp	Oysters	Total fish	Total shellfish	Total	
-----Pounds-----									
1973	January	0	0	55,882	11,519	167,816	67,413	235,229	
	February	0	0	54,314	16,412	197,557	71,190	268,747	
	March	2,958	0	76,158	14,292	193,973	94,881	288,854	
	April	1,777	175	126,457	8,976	196,542	154,970	351,512	
	May	282	31,115	196,153	8,015	866,781	229,484	1,096,265	g
	June	625	20,879	200,595	0	796,001	220,171	1,016,172	
	July	7,880	12,650	161,497	0	670,704	179,567	850,271	
	August	53	30,090	108,248	0	525,402	121,623	647,025	
	September	24,540	47,501	119,749	4,418	642,286	135,477	777,763	
	October	2,040	141,305	144,299	20,511	1,036,669	169,091	1,205,760	
	November	19,000	305,311	116,129	11,286	889,828	130,241	1,020,069	
	December	0	6,350	73,931	11,274	311,040	86,684	397,724	
	Total	59,155	595,376	1,433,412	106,743	6,494,599	1,660,792	8,155,391	

Appendix Table 8.--Continued.

Year	Month	Grouper	Black mullet	Red snapper	Spanish mackerel	Blue runner	Cigarfish	Thread herring	Ladyfish
		-----Pounds-----							
1974	January	26,237	17,239	224,927	93	0	0	0	0
	February	20,989	21,937	179,071	15	0	0	0	0
	March	28,598	12,756	117,685	56,570	0	0	0	1,563
	April	26,275	15,570	72,227	19,227	9,243	10,718	7,348	15,811
	May	40,108	10,380	169,109	7,273	243,182	14,902	1,150	108,340
	June	45,658	16,445	160,474	757	65,521	116,804	50,620	17,654
	July	25,310	28,566	152,384	279	35,245	51,125	125,855	5,820
	August	15,986	31,272	210,927	12,295	17,818	25,845	21,550	6,300
	September	19,077	31,075	71,646	3,285	6,600	60	0	78,205
	October	23,619	66,462	225,076	55,723	4,500	8,660	10,925	246,865
	November	37,180	131,650	121,995	19,456	0	0	0	15,562
	December	38,571	31,755	181,519	0	0	0	0	370
	Total	347,608	415,107	1,887,040	174,973	382,109	228,114	217,449	496,490

Appendix Table 8.--Continued.

Year	Month	Menhaden	Jack crevalle	Shrimp	Oysters	Total fish	Total shellfish	Total
-----Pounds-----								
1974	January	0	7,084	141,428	13,522	327,786	156,217	484,003
	February	0	0	110,978	14,034	259,695	128,053	387,748
	March	0	0	85,226	13,991	297,765	105,519	403,284
	April	513	53,500	103,743	10,903	288,710	121,143	409,853
	May	13,575	111,292	147,257	8,828	766,628	165,976	932,604
	June	7,535	18,172	148,851	2,075	637,184	159,806	796,990
	July	19,659	14,238	175,639	0	620,455	192,290	812,745
	August	44,708	34,724	140,968	0	511,211	156,145	667,356
	September	17,000	1,850	85,341	68	273,262	92,543	365,805
	October	7,700	156,274	166,989	4,318	907,221	174,107	1,081,328
	November	110	13,387	205,423	0	420,099	215,831	635,930
	December	0	1,121	95,522	4,772	324,182	101,811	425,993
	Total	110,800	411,642	1,607,365	72,511	5,634,198	1,769,441	7,403,639

Appendix Table 8.--Continued.

Year	Month	Grouper	Black mullet	Red snapper	Spanish mackerel	Blue runner	Cigarfish	Thread herring	Ladyfish
-----Pounds-----									
1975	January	40,058	36,180	152,877	0	0	0	0	0
	February	56,534	39,136	149,514	0	0	0	0	0
	March	53,755	26,555	121,733	5,093	0	0	0	0
	April	44,058	15,591	74,115	19,047	12,272	2,223	1,100	13,757
	May	35,550	18,507	182,554	4,490	421,369	144,732	30,240	83,046
	June	39,005	18,263	199,113	4,390	77,400	138,744	65,347	45,500
	July	31,635	25,890	230,713	288	25,338	28,360	60,043	16,330
	August	38,307	45,338	339,514	23,078	185,792	11,545	56,736	20,496
	September	32,622	42,481	138,138	37,631	108,577	3,142	7,828	42,017
	October	132,050	183,632	259,530	4,180	9,939	26,438	14,230	139,842
	November	79,265	90,501	158,875	4,525	0	2,225	26,235	90,755
	December	71,167	46,383	174,818	0	0	0	0	0
	Total	654,006	588,457	2,081,494	102,722	840,687	357,409	261,759	451,743

Appendix Table 8.--Continued.

Year	Month	Menhaden	Jack crevalle	Shrimp	Oysters	Total fish	Total shellfish	Total
1975	January	0	0	93,103	6,602	284,097	105,641	389,738
	February	1,126	0	85,429	5,666	350,178	114,712	464,890
	March	153	110	79,615	5,446	300,425	88,607	389,032
	April	9,980	50,720	135,807	4,819	299,983	176,011	475,994
	May	0	45,585	161,404	3,398	1,100,559	192,917	1,293,476
	June	0	36,305	127,772	0	720,350	182,279	902,629
	July	1,400	57,969	82,885	0	559,503	147,130	706,633
	August	13,163	26,754	105,989	0	833,937	203,714	1,037,651
	September	58,470	87,796	94,741	0	639,928	208,102	848,030
	October	0	276,489	151,098	348	1,195,782	159,748	1,355,530
	November	4,246	28,050	146,000	0	563,797	161,092	724,889
	December	0	1,140	94,213	2,194	408,623	104,103	512,726
	Total	88,538	610,918	1,358,056	28,473	7,257,162	1,844,056	9,101,218

Appendix Table 8.--Continued.

Year	Month	Grouper	Black mullet	Red snapper	Spanish mackerel	Blue runner	Cigarfish	Thread herring	Ladyfish
-----Pounds-----									
1976	January	28,933	82,045	55,001	0	0	0	0	0
	February	44,494	24,772	210,857	0	0	90	0	0
	March	28,002	10,073	111,385	18,569	0	0	0	0
	April	18,506	14,430	59,281	42,735	6,764	46,316	0	11,934
	May	24,161	16,028	64,011	9,809	268,938	28,615	0	153,210
	June	41,890	34,424	200,865	64	237,828	110,939	3,650	71,518
	July	31,501	33,456	174,343	598	31,247	74,061	0	68,628
	August	25,911	37,644	141,261	0	10,485	76,953	0	12,395
	September	49,580	39,773	225,784	34,467	68,067	1,111	1,475	163,126
	October	16,413	212,227	150,893	1,024	6,691	2,802	0	249,011
	November	21,252	169,071	179,572	0	116	0	0	236
	December	9,475	42,944	139,667	0	0	0	0	0
	Total	340,118	716,890	1,712,920	107,266	630,136	304,887	5,125	730,058

Appendix Table 8.--Continued.

Year	Month	Menhaden	Jack crevalle	Shrimp	Oysters	Total fish	Total shellfish	Total
-----Pounds-----								
1976	January	0	0	41,439	892	239,408	47,686	287,094
	February	1,126	0	28,616	4,736	366,756	36,616	403,372
	March	153	110	47,232	3,765	317,098	73,202	390,300
	April	9,980	50,720	100,611	1,362	254,463	119,036	373,499
	May	0	45,585	99,736	0	640,379	135,696	776,075
	June	0	36,305	116,390	0	924,064	158,923	1,082,987
	July	1,400	57,969	133,968	0	769,709	217,702	987,411
	August	13,163	26,754	75,017	0	439,247	158,507	597,754
	September	58,470	87,796	65,355	0	830,736	121,630	952,366
	October	0	276,489	119,256	204	866,534	200,473	1,067,007
	November	4,246	28,050	141,646	3,369	485,923	152,556	638,479
	December	0	1,140	84,832	13,832	271,123	120,494	391,617
	Total	88,538	610,918	1,054,098	28,160	6,405,440	1,542,521	7,947,961

Source: Florida Landings, monthly issues. U.S. Department of Commerce.

Appendix Table 9.--Total landings of selected fish and shellfish species by months, Gulf County, 1971-1976.

Year	Month	Grouper	Black mullet	Red snapper	Spanish Mackerel	Blue runner	Cigarfish	Thread herring	Ladyfish
-----Pounds-----									
1971	January	11,699	65,410	9,445	7,750	900	0	0	2,870
	February	21,023	5,794	722	0	0	0	0	0
	March	17,526	8,050	1,699	0	0	0	0	0
	April	30,650	16,944	3,247	102,043	1,656	9,510	13,131	5,850
	May	24,887	0	9,088	14,690	20,677	4,430	1,000	75
	June	8,782	27,136	7,500	44,459	255,269	20,335	36,433	73,838
	July	20,909	10,745	9,350	19	0	0	0	0
	August	6,823	21,258	15,019	71,415	74,718	5,231	2,030	29,090
	September	12,247	8,410	4,712	353	10	0	0	0
	October	3,393	25,551	20,417	1,678	0	0	0	0
	November	112	336,908	29,649	58,846	29,500	0	1,050	18,085
	December	12,602	33,311	4,729	36,499	15,670	0	83,030	9,275
	Total	170,113	559,567	115,577	337,752	398,400	39,506	136,674	139,083

Appendix Table 9.--Continued.

Year	Month	Menhaden	Jack crevalle	Shrimp	Oysters	Total fish	Total shellfish	Total
-----Pounds-----								
1971	January	0	0	23,709	13,685	117,952	37,394	155,346
	February	0	0	5,269	a	34,922	5,269	40,191
	March	0	0	22,276	a	30,027	22,406	52,433
	April	0	0	36,136	0	193,913	36,189	230,102
	May	0	0	60,260	5,512	93,931	66,008	159,939
	June	0	8,200	35,318	0	541,527	36,203	577,730
	July	0	0	54,530	0	67,569	68,917	136,486
	August	0	3,525	25,958	0	285,015	45,116	330,131
	September	0	0	33,243	5,136	34,062	42,056	76,118
	October	0	265	48,985	4,778	74,627	54,493	129,120
	November	0	1,835	1,036	0	510,976	1,036	512,012
	December	0	0	52,106	5,958	270,257	58,064	328,321
	Total	0	13,825	398,826	35,069	2,254,778	473,151	2,727,929

Appendix Table 9.--Continued.

Year	Month	Grouper	Black mullet	Red snapper	Spanish mackerel	Blue runner	Cigarfish	Thread herring	Ladyfish
-----Pounds-----									
1972	January	12,384	10,388	6,833	1,487	0	0	0	0
	February	1,548	14,168	4,743	6,277	0	0	0	0
	March	4,778	30,154	12,328	60,070	14,625	850	0	0
	April	21,309	5,411	6,301	15,648	1,215	1,985	0	0
	May	17,443	6,622	10,658	4,886	11,831	0	0	0
	June	20,661	57,214	11,569	38,635	59,894	775	107,150	79,760
	July	34,009	23,463	23,756	174	27	0	0	0
	August	44,709	45,508	26,951	14,787	21,299	8,640	63,865	14,085
	September	22,015	17,417	18,787	2,564	4,986	0	0	0
	October	33,885	70,194	16,605	52,750	60,100	1,700	37,095	95,510
	November	13,082	259,101	3,144	55,740	8,950	0	65,835	537
	December	9,821	75,960	12,421	18,640	9,450	0	25,110	0
	Total	235,644	615,600	154,096	371,658	192,377	13,950	299,055	189,892

Appendix Table 9.--Continued.

Year	Month	Menhaden	Jack crevalle	Shrimp	Oysters	Total fish	Total shellfish	Total
-----Pounds-----								
1972	January	4,217	0	37,370	8,298	56,445	45,668	102,113
	February	1,925	0	16,602	6,737	45,978	23,339	69,317
	March	21,125	0	31,636	5,539	171,164	37,175	208,339
	April	0	0	56,195	2,152	60,615	58,347	118,962
	May	1,200	95	90,853	1,006	63,377	91,859	155,236
	June	400	110	64,143	0	391,725	64,279	456,004
	July	63	170	30,957	0	91,246	37,384	128,630
	August	71,744	5,781	33,399	0	335,990	39,652	375,642
	September	0	29	51,475	3,868	74,068	56,646	130,714
	October	1,200	36,478	68,519	1,662	607,989	70,469	678,458
	November	0	17,200	49,570	1,513	505,968	51,083	557,051
	December	0	33,610	38,671	2,668	243,142	41,339	284,481
	Total	101,874	93,473	569,390	33,443	2,647,707	617,240	3,264,947

Appendix Table 9.--Continued.

Year	Month	Grouper	Black mullet	Red snapper	Spanish mackerel	Blue runner	Cigarfish	Thread herring	Ladyfish
-----Pounds-----									
1973	January	355	59,133	12,332	0	0	0	0	0
	February	57	24,341	4,557	0	0	0	0	0
	March	9,229	3,843	3,766	3,023	0	0	0	0
	April	6,618	8,212	10,273	791	9,150	0	0	0
	May	23,082	12,966	7,774	9,128	160,785	10,791	7,175	250,784
	June	9,354	16,822	7,680	5,416	17,270	71,667	104,165	151,442
	July	5,067	11,606	4,078	3,168	1,465	15,625	167,894	8,432
	August	9,379	14,422	763	34,057	42,768	9,820	72,530	8,025
	September	5,360	45,091	302	57,078	30,354	780	123,715	25,291
	October	8,159	160,178	225	131,933	825	0	75,650	196,184
	November	5,226	428,954	721	51,430	0	0	0	36,749
	December	3,473	13,651	780	0	0	0	0	0
	Total	85,359	799,219	53,251	296,024	262,617	108,683	551,129	676,907

Appendix Table 9.--Continued.

Year	Month	Menhaden	Jack crevalle	Shrimp	Oysters	Total fish	Total shellfish	Total
-----Pounds-----								
1973	January	65	36,395	30,583	1,925	125,477	32,508	157,985
	February	0	14	24,044	1,330	41,272	25,374	66,646
	March	0	0	40,985	1,225	27,484	42,253	69,737
	April	8,046	4,225	61,071	1,286	57,218	62,357	119,575
	May	32,400	32,096	101,523	665	606,597	102,188	708,785
	June	0	9,699	90,715	0	504,874	93,346	598,220
	July	221,165	18,056	62,689	0	506,181	70,640	576,821
	August	150,711	380	65,357	0	376,261	78,049	454,310
	September	202,685	3,596	80,502	158	527,435	85,272	612,707
	October	118,797	36,994	87,200	691	861,746	88,653	950,399
	November	0	95,047	54,229	487	637,972	54,716	692,688
	December	0	53,507	32,893	639	95,264	40,742	136,006
	Total	733,869	290,009	731,791	8,406	4,367,781	776,098	5,143,879

Appendix Table 9.--Continued.

Year	Month	Grouper	Black mullet	Red snapper	Spanish mackerel	Blue runner	Cigarfish	Thread herring	Ladyfish
-----Pounds-----									
1974	January	3,799	8,716	431	0	29	0	0	0
	February	8,275	8,350	2,597	0	0	0	0	0
	March	5,797	8,195	499	67,257	0	0	0	0
	April	1,255	5,101	3,598	2,224	175	85	8,750	138,000
	May	7,687	7,665	6,922	3,886	51,992	2,488	6,425	370,073
	June	9,742	8,330	6,384	2,614	31,965	131,951	47,532	46,826
	July	7,958	11,100	6,047	4,060	64,778	47,182	143,545	5,890
	August	7,306	14,300	1,583	8,736	0	600	158,399	23,728
	September	2,559	24,980	11,583	10,992	6,565	0	16,040	153,279
	October	104	35,903	286	121,953	2,575	100	94,400	307,988
	November	2,647	231,546	597	19,585	0	0	28,250	82,081
	December	671	11,122	221	0	0	0	0	0
	Total	57,800	375,308	40,748	241,307	158,079	182,406	503,341	1,127,865

Appendix Table 9.--Continued.

Year	Month	Menhaden	Jack crevalle	Shrimp	Oysters	Total fish	Total shellfish	Total
-----Pounds-----								
1974	January	0	0	42,149	1,251	18,501	43,400	61,901
	February	0	0	37,952	988	31,797	38,956	70,753
	March	8,100	0	50,200	1,452	95,362	51,652	147,014
	April	14,883	80,031	60,490	945	328,178	61,616	389,794
	May	21,860	22,489	94,172	227	529,212	94,545	623,757
	June	92,695	1,286	81,645	0	557,534	82,415	639,949
	July	148,540	2,621	61,499	0	633,466	67,208	700,674
	August	14,238	15,110	64,279	0	334,415	65,355	399,770
	September	50,965	500	57,413	648	323,819	58,061	381,880
	October	0	93,135	73,446	499	691,760	73,990	765,750
	November	2,000	34,845	58,879	718	470,608	59,597	530,205
	December	0	0	64,698	936	25,783	65,634	91,417
	Total	353,281	250,017	746,822	7,664	4,040,435	762,429	4,802,864

Appendix Table 9.--Continued.

Year	Month	Grouper	Black mullet	Red snapper	Spanish mackerel	Blue runner	Cigarfish	Thread herring	Ladyfish
-----Pounds-----									
1975	January	1,331	8,738	2,644	0	0	0	0	0
	February	1,163	4,763	1,736	0	0	0	0	0
	March	3,171	5,324	92	1,045	0	0	0	0
	April	7,876	10,272	2,095	32,177	43,945	0	40,835	0
	May	9,123	23,279	3,447	13,304	175,413	25,995	31,988	11,167
	June	9,061	44,384	5,654	164	29,035	22,170	31,190	5,320
	July	3,510	18,518	3,680	2,528	844	7,035	46,427	0
	August	4,700	19,021	449	5,272	52,318	5,150	20,550	44,198
	September	2,782	31,632	240	17,895	26,152	245	34,180	84,405
	October	7,619	151,866	1,299	19,778	1,619	28	78,575	229,965
	November	8,655	305,984	675	9,945	78	235	69,530	0
	December	3,963	83,031	223	0	0	0	4,075	0
	Total	62,954	706,812	22,234	102,108	329,404	60,858	357,350	375,055

Appendix Table 9.--Continued.

Year	Month	Menhaden	Jack crevalle	Shrimp	Oysters	Total fish	Total shellfish	Total
-----Pounds-----								
1975	January	0	0	29,935	1,671	22,928	32,232	55,160
	February	0	0	49,358	1,890	11,867	51,757	63,624
	March	0	0	36,847	2,038	12,876	39,613	52,489
	April	29,770	274,346	70,748	2,012	454,370	79,036	533,406
	May	33,980	147,500	82,854	446	528,761	89,111	617,872
	June	91,776	15,052	78,746	0	276,107	80,652	356,759
	July	31,221	49,913	40,485	0	259,992	42,915	302,907
	August	74,928	12,585	29,094	0	355,247	41,111	396,358
	September	21,815	13,562	27,269	1,514	252,015	47,237	299,252
	October	0	19,890	37,267	3,798	536,260	57,052	593,312
	November	9,000	45,940	36,595	5,442	493,227	52,505	545,732
	December	0	21,719	35,152	5,434	199,071	48,202	247,273
	Total	292,490	600,507	554,350	24,245	3,402,721	661,423	4,064,144

Appendix Table 9.--Continued.

Year	Month	Grouper	Black mullet	Red snapper	Spanish mackerel	Blue runner	Cigarfish	Thread herring	Ladyfish
-----Pounds-----									
1976	January	57	64,500	78	0	0	0	0	0
	February	945	7,054	245	0	0	0	0	0
	March	0	2,640	25	3,896	0	0	0	0
	April	252	5,100	0	55,179	0	28,738	7,450	111,732
	May	0	25,584	0	11,486	133,200	15,200	20,215	530,814
	June	258	49,527	145	2,135	3,160	38,510	26,485	135,360
	July	1,304	15,903	340	2,133	1,707	2,605	38,480	5,163
	August	177	17,383	130	179	0	3,005	13,730	32,199
	September	0	22,454	112	4,254	2,651	0	56,060	332,727
	October	0	58,437	105	1,171	121	538	89,310	509,347
	November	414	220,996	297	435	0	4,555	0	100
	December	0	7,411	0	0	0	0	0	0
	Total	3,407	496,989	1,477	80,868	140,839	93,151	251,730	1,657,442

Appendix Table 9.--Continued.

Year	Month	Menhaden	Jack crevalle	Shrimp	Oysters	Total fish	Total shellfish	Total
-----Pounds-----								
1976	January	0	0	15,973	7,254	68,273	81,569	149,842
	February	0	0	7,212	5,268	12,543	16,088	28,631
	March	0	0	53,954	4,314	8,126	60,405	68,531
	April	0	100,973	51,785	3,316	392,364	57,897	450,261
	May	0	27,501	70,601	490	804,900	77,773	882,673
	June	23,280	16,512	73,558	0	414,060	85,543	499,603
	July	363,600	0	60,767	0	528,636	109,483	638,119
	August	191,490	0	24,319	0	321,715	95,309	417,024
	September	0	0	36,711	3,465	489,214	43,479	532,693
	October	7,000	5,350	61,561	4,095	741,837	66,327	808,164
	November	52,170	0	52,939	5,320	342,260	59,021	401,281
	December	17,975	0	27,065	6,090	88,008	35,955	123,963
	Total	655,515	150,336	536,445	39,612	4,211,936	788,849	5,000,785

^aIncludes Franklin County

Source: Florida Landings, monthly issues. U.S. Department of Commerce.

Appendix Table 10.-- Total landings of selected fish and shellfish species by months, Franklin County,
1971-1976.

Year	Month	Grouper	Black mullet	Red snapper	Shrimp	Oysters	Blue crab	Total fish	Total shellfish	Total
-----Pounds-----										
1971	January	19,968	33,076	456	91,424	464,468	85,070	100,460	640,960	741,422
	February	29,835	27,902	1,633	46,300	448,314 ^a	81,981	86,399	576,595	662,994
	March	42,403	52,508	3,602	54,379	469,547 ^a	116,527	130,082	640,453	770,535
	April	26,641	39,000	2,949	93,871	371,224	179,894	138,182	645,001	783,183
	May	37,814	45,928	1,788	308,033	216,824	143,012	236,281	667,869	904,150
	June	49,638	80,129	2,602	205,572	0	124,751	278,905	330,352	609,257
	July	55,099	77,006	5,415	305,736	0	96,256	265,766	401,992	667,758
	August	33,937	88,494	2,556	109,307	0	75,414	226,349	184,721	411,070
	September	224	91,678	0	103,104	212,777	68,025	130,226	383,906	514,132
	October	17,123	169,566	871	196,104	234,176	55,964	271,314	486,244	757,558
	November	0	117,882	0	163,644	305,788	35,585	149,095	505,044	654,139
	December	1,522	38,546	739	104,578	453,456	36,007	64,426	594,041	658,467
	Total	314,204	861,715	22,611	1,782,052	3,176,574	1,098,486	2,077,485	6,057,180	8,134,665

Appendix Table 10.--Continued.

Year	Month	Grouper	Black mullet	Red snapper	Shrimp	Oysters	Blue crab	Total fish	Total shellfish	Total
-----Pounds-----										
1972	January	12,581	56,408	407	125,432	430,579	92,027	106,643	648,038	754,681
	February	7,170	96,189	2,655	54,063	430,167	46,198	148,795	530,428	679,223
	March	4,895	68,082	993	110,930	440,096	139,552	122,075	690,702	812,777
	April	16,558	69,314	1,381	362,274	360,251	146,206	155,920	874,021	1,029,941
	May	33,050	78,348	2,691	350,936	223,320	717,455	219,439	1,294,929	1,514,368
	June	30,908	74,261	1,474	175,637	0	207,155	164,116	382,918	547,034
	July	39,307	105,715	550	209,562	0	448,960	243,246	659,040	902,286
	August	0	88,542	0	136,160	0	188,151	132,016	324,409	456,425
	September	0	100,967	0	222,123	195,509	73,452	121,530	491,139	612,669
	October ^b	5,466	156,108	36	162,149	215,395	129,605	194,512	507,149	701,661
	November	3,296	114,905	292	191,652	308,982	72,627	180,992	573,278	754,270
	December	15,768	77,547	154	108,473	362,764	77,969	152,504	549,218	701,722
	Total	168,999	1,086,386	10,633	2,209,391	2,967,063	2,339,357	1,941,788	7,525,269	9,467,057

Appendix Table 10.--Continued.

Year	Month	Grouper	Black mullet	Red snapper	Shrimp	Oysters	Blue crab	Total fish	Total shellfish	Total
-----Pounds-----										
1973	January	31,653	86,522	415	100,882	345,687	67,105	185,600	513,737	699,337
	February	14,639	73,333	567	75,686	305,276	42,600	123,150	425,442	548,592
	March	19,201	45,208	264	151,404	266,608	115,339	87,140	537,667	624,807
	April	26,285	50,983	803	340,556	176,558	189,813	110,659	707,921	818,580
	May	38,380	73,714	1,808	677,940	127,483	253,946	160,499	1,061,824	1,222,323
	June	52,695	77,604	5,359	424,404	0	286,431	211,080	712,496	923,576
	July	62,218	88,188	1,479	187,607	0	217,000	222,974	405,679	628,653
	August	53,436	126,911	14,717	81,899	0	231,200	255,358	319,744	575,102
	September	28,467	114,424	3,883	155,007	172,321	241,848	180,566	569,332	749,898
	October	24,719	182,932	4,481	155,107	218,373	157,910	277,091	531,473	808,564
	November	22,430	232,066	5,436	305,789	286,030	96,535	293,316	688,493	981,809
	December	9,232	62,096	2,439	139,666	287,509	26,426	109,728	453,622	563,350
	Total	383,355	1,213,981	39,212	2,795,947	2,185,845	1,926,153	2,217,161	6,927,430	9,144,591

Appendix Table 10.--Continued.

Year	Month	Grouper	Black mullet	Red snapper	Shrimp	Oysters	Blue crab	Total fish	Total shellfish	Total
-----Pounds-----										
1974	January	26,950	31,806	5,858	395,461	453,216	54,534	97,729	905,450	1,003,179
	February	4,015	41,859	1,213	403,747	330,510	35,879	76,207	774,744	850,951
	March	14,970	43,251	10,658	423,498	315,001	75,338	101,856	814,389	916,245
	April	9,556	33,928	6,297	429,530	276,733	81,958	90,436	789,635	880,071
	May	25,386	25,424	25,079	323,676	103,909	213,930	113,120	642,312	755,432
	June	33,658	37,874	16,943	301,090	0	201,334	139,606	503,003	642,609
	July	31,666	68,981	11,787	300,275	0	261,932	153,821	563,814	717,635
	August	17,859	52,459	9,685	144,342	0	189,725	92,986	335,569	428,555
	September	27,290	69,453	8,559	184,243	179,352	132,264	118,367	495,859	614,226
	October	8,797	110,637	5,314	304,333	246,855	64,844	160,766	616,086	776,852
	November	28,508	94,536	10,099	558,574	231,885	34,052	161,217	824,524	985,741
	December	23,479	34,936	4,543	194,834	316,534	20,545	107,747	532,953	640,700
	Total	252,134	645,144	116,036	3,963,603	2,453,995	1,366,335	1,413,858	7,798,338	9,212,196

Appendix Table 10.--Continued.

Year	Month	Grouper	Black mullet	Red snapper	Shrimp	Oysters	Blue crab	Total fish	Total shellfish	Total
-----Pounds-----										
1975	January	22,044	41,426	5,517	211,395	334,774	141,219	103,999	705,033	809,032
	February	19,365	26,659	10,153	251,728	303,396	125,322	91,085	685,270	776,355
	March	9,268	52,173	3,223	303,641	271,303	95,195	85,299	681,344	766,643
	April	26,100	74,006	6,998	582,045	224,557	159,726	134,648	993,082	1,127,730
	May	26,109	81,107	8,778	702,190	81,138	190,493	147,003	928,578	1,129,581
	June	11,168	83,182	3,677	620,706	0	190,363	123,477	836,630	960,107
	July	20,817	73,034	7,481	379,659	0	178,188	128,984	575,558	704,542
	August	17,156	107,916	8,826	199,793	0	175,319	150,407	460,037	610,444
	September	18,728	91,615	5,093	242,526	149,367	158,871	141,906	666,736	808,642
	October	42,981	162,779	7,656	435,221	131,892	200,077	242,039	847,986	1,090,025
	November	26,183	135,312	5,042	323,783	192,257	60,044	213,549	710,539	924,088
	December	20,799	54,936	4,075	233,380	275,743	52,349	116,145	856,067	972,212
	Total	260,808	984,205	76,518	4,486,067	1,974,427	1,726,166	1,678,541	9,000,086	10,679,401

Appendix Table 10.--Continued.

Year	Month	Grouper	Black mullet	Red snapper	Shrimp	Oysters	Blue crab	Total fish	Total shellfish	Total
-----Pounds-----										
1976	January	17,000	35,379	2,790	180,975	362,251	12,113	99,338	980,175	1,079,513
	February	17,969	30,872	2,629	88,055	336,980	75,116	74,870	854,482	929,352
	March	33,360	19,266	5,582	256,102	301,383	115,882	94,604	1,118,906	1,213,510
	April	20,350	25,065	8,464	467,417	255,696	180,720	95,415	1,229,690	1,325,105
	May	38,841	36,260	4,282	383,443	119,120	182,378	92,021	802,307	894,474
	June	32,567	115,515	10,576	378,751	0	372,312	183,272	857,307	1,040,579
	July	34,868	67,524	10,699	226,884	0	233,071	138,048	637,074	775,122
	August	15,182	69,537	4,308	139,676	0	192,997	107,389	514,871	622,260
	September	31,754	77,697	6,538	266,964	199,807	169,545	148,491	754,652	903,143
	October	10,911	107,948	3,927	310,231	224,102	73,844	155,910	617,992	773,832
	November	18,488	118,237	2,840	255,840	329,761	65,421	182,911	652,792	835,703
	December	15,808	41,375	2,004	205,781	374,341	68,762	99,762	659,059	758,821
	Total	287,098	744,675	64,639	3,160,119	2,503,441	1,742,161	1,472,031	9,679,383	11,151,414

^aIncludes Gulf County.^bIncludes both Franklin and Wakulla Counties.Source: Florida Landings, monthly issues. U.S. Department of Commerce.

Appendix Table 11. -- Total landings of selected fish and shellfish species by months, Wakulla County, 1971-1976.

Year	Month	Grouper	Black mullet	Red drum	Spotted sea trout	Blue crab	Total fish	Total shellfish	Total
-----Pounds-----									
1971	January	0	32,376	1,820	6,884	110,633	43,118	110,743	153,861
	February	0	39,320	5,956	6,486	248,665	71,934	249,640	321,574
	March	0	137,856	1,876	15,908	223,295	162,209	227,265	389,474
	April	300	96,949	0	3,351	298,867	104,940	300,809	405,749
	May	250	30,177	1,269	542	616,508	54,077	619,187	673,264
	June	380	14,328	0	896	667,525	58,379	667,525	725,904
	July	0	8,388	0	425	525,134	30,387	525,135	555,521
	August	0	22,331	2,448	1,296	294,543	202,777	294,543	497,320
	September	371	105,668	2,397	3,187	196,781	169,891	198,793	368,684
	October	0	100,470	829	79	93,739	105,553	95,139	200,692
	November	0	200,201	319	680	77,424	204,224	77,586	281,810
	December	0	138,443	2,611	6,790	172,419	149,213	174,126	323,339
	Total	1,301	926,497	19,525	46,524	3,525,533	1,356,702	3,540,491	4,897,193

Appendix Table 11.-- Continued.

Year	Month	Grouper	Black mullet	Red drum	Spotted sea trout	Blue crab	Total fish	Total shellfish	Total
-----Pounds-----									
1972	January	0	8,660	150	400	102,140	17,510	102,740	120,250
	February	0	5,963	0	30	182,385	5,993	183,027	189,020
	March	0	15,383	1,400	1,455	404,467	19,768	408,905	428,673
	April	5,350	25,222	907	2,251	219,607	111,543	225,005	336,548
	May	0	3,400	0	0	0	3,530	0	3,530
	June	4,366	169,655	136	2,225	190,363	183,646	190,363	374,009
	July	10,675	106,410	855	2,702	119,337	130,542	119,337	249,879
	August	0	6,340	0	0	22,585	6,340	22,585	28,925
	September	0	27,225	450	555	216,143	28,398	216,143	244,541
	October ^a	7,864	156,108	2,331	7,595	129,605	194,512	507,149	701,661
	November	0	171,335	1,877	5,097	17,049	182,354	17,910	200,264
	December	0	108,786	7,570	39,094	81,075	162,559	81,075	243,634
	Total	28,255	804,487	15,676	61,404	1,684,756	1,046,695	2,074,239	3,120,934

Appendix Table 11.--Continued.

Year	Month	Grouper	Black mullet	Red drum	Spotted sea trout	Blue crab	Total fish	Total shellfish	Total
-----Pounds-----									
1973	January	0	83,697	4,750	19,075	74,848	112,067	74,848	186,915
	February	0	8,363	1,000	200	121,434	9,721	128,434	138,155
	March	755	50,985	890	2,360	153,964	61,870	157,964	219,834
	April	3,670	62,750	375	4,820	350,589	89,845	350,589	440,434
	May	9,460	50,997	465	4,855	557,859	122,165	571,848	694,013
	June	6,045	92,444	160	4,360	537,309	199,775	542,608	742,383
	July	4,771	99,236	774	3,179	377,617	162,506	380,867	543,373
	August	3,620	93,853	1,057	1,858	248,356	108,090	248,356	356,446
	September	2,675	98,688	1,025	3,485	151,452	123,131	151,916	275,047
	October	1,762	174,132	4,055	7,720	265,756	447,122	271,830	718,952
	November	500	448,000	2,260	10,115	272,851	470,085	276,150	746,235
	December	0	76,285	3,845	13,730	199,839	101,635	203,939	305,574
	Total	33,258	1,339,430	20,656	75,757	3,311,874	2,008,012	3,359,349	5,367,361

Appendix Table 11.--Continued.

Year	Month	Grouper	Black mullet	Red drum	Spotted sea trout	Blue crab	Total fish	Total shellfish	Total
-----Pounds-----									
1974	January	450	30,050	3,715	8,765	324,853	82,308	331,654	413,962
	February	3,715	27,670	10,180	19,480	391,620	99,108	400,321	499,429
	March	2,875	22,590	3,125	7,730	422,822	129,590	424,102	553,692
	April	2,190	24,643	4,424	8,115	509,048	180,802	509,048	689,850
	May	840	16,399	2,749	2,152	446,130	120,580	446,130	566,710
	June	561	10,015	812	1,000	309,337	99,637	309,337	408,974
	July	525	11,396	285	422	242,176	69,675	242,176	311,851
	August	2,717	83,330	701	3,145	156,731	159,724	156,731	316,455
	September	1,040	109,393	2,377	4,375	215,368	282,933	219,685	502,618
	October	5,407	192,121	6,981	13,816	218,276	292,100	224,291	516,391
	November	360	155,325	12,895	20,402	224,813	222,402	230,893	453,295
	December	550	91,633	10,985	24,153	360,410	158,736	366,155	524,891
	Total	21,230	744,565	59,229	113,555	3,821,584	1,897,595	3,860,523	5,758,118

Appendix Table 11.--Continued.

Year	Month	Grouper	Black mullet	Red drum	Spotted sea trout	Blue crab	Total fish	Total shellfish	Total
-----Pounds-----									
1975	January	155	51,513	6,985	16,795	435,951	124,710	444,056	568,766
	February	415	58,570	4,672	12,661	429,051	121,735	438,647	560,382
	March	1,400	84,097	2,445	4,945	223,388	109,615	231,558	341,173
	April	6,325	89,110	745	4,560	431,934	137,851	434,790	572,641
	May	7,405	58,797	1,545	3,045	576,023	122,270	577,904	700,174
	June	5,733	79,655	450	5,422	419,884	155,188	419,884	575,072
	July	7,395	75,795	620	8,385	358,190	210,230	358,190	568,420
	August	3,425	88,995	1,375	9,464	232,672	215,388	232,672	448,060
	September	1,000	117,825	1,770	10,530	155,699	219,835	156,699	376,534
	October	230	174,898	7,587	13,130	148,200	202,026	156,240	358,266
	November	0	61,285	1,500	3,000	75,300	65,785	76,045	141,830
	December	0	77,665	1,500	3,000	70,958	82,165	70,958	153,123
	Total	33,483	1,018,205	31,194	94,937	3,557,250	1,766,798	3,597,643	5,364,441

Appendix Table 11.--Continued.

Year	Month	Grouper	Black mullet	Red drum	Spotted sea trout	Blue crab	Total fish	Total shellfish	Total
-----Pounds-----									
1976	January	0	58,376	4,207	20,580	62,178	102,903	64,513	167,416
	February	0	48,760	2,427	13,654	175,000	69,778	178,910	248,688
	March	0	27,930	640	1,365	113,587	83,710	118,995	202,705
	April	200	32,956	0	11,075	280,316	181,031	284,716	465,747
	May	240	30,599	0	735	299,336	39,631	300,636	340,267
	June	688	46,050	900	2,327	301,376	56,405	301,376	357,781
	July	1,835	52,800	0	876	288,833	99,311	296,033	395,344
	August	760	59,018	0	1,390	200,465	102,518	202,385	304,903
	September	0	76,975	640	3,650	110,286	87,416	121,947	209,363
	October	0	10,856	2,700	3,100	150,820	17,656	152,020	169,676
	November	0	49,860	4,680	5,700	81,328	60,240	81,328	141,568
	December	0	22,490	1,270	10,762	32,900	34,987	32,900	67,887
	Total	3,723	516,670	17,464	75,214	2,096,425	935,586	2,135,759	3,071,345

^aIncludes both Franklin and Wakulla counties.

Source: Florida Landings, monthly issues. U.S. Department of Commerce.

Appendix Table 12.-- Total landings of selected fish and shellfish species by months, Nassau County,
1971-1976.

Year	Month	Grouper	King whiting	Menhaden	Red snapper	Shrimp	Blue crab	Total fish ^a	Total shellfish	Total
-----Pounds-----										
1971	January	0	5,887	0	0	69,487	53,021	6,002	122,508	128,510
	February	0	18,708	0	0	15,027	40,659	19,741	55,686	75,427
	March	0	49,013	0	0	11,313	49,297	49,699	60,610	110,309
	April	0	12,836	135,340	0	21,327	63,342	13,756	84,669	98,425
	May	8,979	556	3,719,840	1,139	93,291	95,674	11,584	188,965	200,549
	June	7,805	1,971	3,352,680	1,026	106,404	89,434	12,470	195,838	208,308
	July	17,745	2,764	1,610,680	6,010	96,234	102,847	27,804	199,081	226,885
	August	12,048	2,527	3,853,840	830	70,878	67,480	16,764	138,358	155,122
	September	25,794	2,870	3,406,950	2,108	132,463	108,136	32,377	240,599	272,976
	October	0	7,817	2,936,610	0	186,485	99,612	11,166	286,097	297,263
	November	0	7,535	0	0	168,735	100,114	11,446	268,849	280,295
	December	0	9,145	0	0	132,442	53,099	10,426	185,541	195,967
	Total	72,371	121,629	19,015,940	11,113	1,104,086	922,715	223,235	2,026,801	2,228,164

Appendix Table 12.--Continued.

Year	Month	Grouper	King whiting	Menhaden	Red snapper	Shrimp	Blue crab	Total fish ^a	Total shellfish	Total
-----Pounds-----										
1972	January	0	14,587	0	46	73,056	60,435	15,314	133,491	148,805
	February	0	8,872	0	0	13,202	24,798	9,209	38,000	47,209
	March	0	18,978	0	0	29,672	51,206	19,951	80,878	100,829
	April	0	5,892	2,333,610	0	34,621	60,743	6,153	95,364	101,517
	May	0	2,465	1,359,430	0	109,208	56,542	2,688	165,750	168,438
	June	2,338	7,064	5,788,130	470	73,074	57,438	12,049	130,512	142,561
	July	25,890	11,508	5,268,880	2,329	100,430	0	43,927	100,430	144,357
	August	25,199	11,877	4,728,860	1,548	106,294	81,329	41,715	187,623	229,338
	September	0	6,402	583,570	0	171,104	87,286	9,086	258,390	267,476
	October	15,010	6,489	195,640	3,739	152,885	76,774	31,831	229,659	261,490
	November	0	7,436	67,000	0	200,901	77,036	11,776	279,512	291,288
	December	0	5,519	0	0	115,267	32,987	6,791	148,254	155,045
	Total	68,437	107,089	20,325,120	8,132	1,179,714	666,574	210,490	1,847,863	2,058,353

Appendix Table 12.--Continued.

Year	Month	Grouper	King whiting	Menhaden	Red snapper	Shrimp	Blue crab	Total fish ^a	Total shellfish	Total
-----Pounds-----										
1973	January	55	1,584	0	38	47,122	27,027	2,133	74,149	76,282
	February	55	0	0	35	4,133	18,945	446	23,078	23,524
	March	0	0	0	0	427	15,266	0	15,693	15,693
	April	0	884	0	0	13,696	42,238	9,189	55,934	65,123
	May	130	1,705	2,575,480	186	37,426	79,892	29,142	117,318	146,460
	June	0	926	4,468,900	0	85,380	105,916	1,244	191,296	192,540
	July	0	11	3,660,880	0	58,353	70,786	11	129,751	129,762
	August	240	3,106	4,011,960	167	41,267	42,302	4,499	83,569	88,068
	September	0	2,729	2,535,280	0	80,624	51,255	4,810	132,687	137,497
	October	0	4,138	235,170	0	128,605	95,561	6,560	224,931	231,491
	November	0	8,327	8,746	0	107,972	137,048	15,107	245,020	260,127
	December	0	5,142	0	0	80,374	52,460	7,808	132,834	140,642
	Total	480	28,552	17,496,416	426	685,379	738,696	80,949	1,426,260	1,507,209

Appendix Table 12.--Continued.

Year	Month	Grouper	King whiting	Menhaden	Red snapper	Shrimp	Blue crab	Total fish ^a	Total shellfish	Total
-----Pounds-----										
1974	January	0	4,418	0	460	29,112	55,763	25,426	87,150	112,576
	February	0	1,967	0	0	6,814	39,169	7,497	45,983	53,480
	March	200	6,666	0	149	3,790	53,106	14,373	56,896	71,269
	April	0	1,250	2,389,890	400	8,807	59,382	3,750	68,189	71,939
	May	27	6,345	2,342,990	610	76,587	88,970	9,917	165,557	175,474
	June	29	5,102	0	336	48,619	106,123	6,542	154,869	161,411
	July	214	8,735	3,226,720	270	48,828	93,239	20,845	142,110	162,955
	August	5,045	5,044	2,372,637	1,559	49,464	102,741	19,883	152,205	172,088
	September	85	2,721	656,600	292	135,747	62,500	7,041	198,247	205,288
	October	596	6,511	231,150	635	138,545	89,385	17,392	227,930	245,322
	November	0	5,723	342,370	125	59,767	73,015	8,241	132,839	141,080
	December	0	4,867	0	29	91,223	48,391	5,778	140,214	145,992
	Total	6,196	59,349	11,562,357	4,865	697,303	871,784	146,685	1,572,189	1,718,874

Appendix Table 12.--Continued.

Year	Month	Grouper	King whiting	Menhaden	Red snapper	Shrimp	Blue crab	Total fish ^a	Total shellfish	Total
-----Pounds-----										
1975	January	12	3,032	0	253	16,701	40,700	6,172	57,401	63,573
	February	0	2,708	0	147	9,614	28,004	4,649	37,618	42,267
	March	0	2,760	0	161	962	15,080	4,001	16,042	20,043
	April	0	341	1,486,730	0	7,906	32,183	505	40,089	40,594
	May	382	7,027	3,372,780	640	90,327	54,075	13,746	114,402	128,148
	June	85	1,479	3,155,700	449	106,580	63,111	4,241	169,691	170,932
	July	24	2,411	720,250	950	41,665	94,479	8,011	136,144	144,155
	August	182	3,224	2,027,420	1,054	23,118	64,893	8,673	88,011	96,684
	September	29	2,951	375,200	583	117,011	53,065	7,917	170,086	178,003
	October	239	9,363	372,520	571	199,099	80,541	22,666	279,640	302,306
	November	89	9,770	0	321	100,011	72,075	19,525	174,770	194,295
	December	284	8,003	0	336	102,442	52,854	13,708	155,296	169,004
	Total	1,326	53,069	11,510,600	5,465	815,436	651,060	113,814	1,439,190	1,553,004

Appendix Table 12.--Continued.

Year	Month	Grouper	King whiting	Menhaden	Red snapper	Shrimp	Blue crab	Total fish ^a	Total shellfish	Total
-----Pounds-----										
1976	January	89	7,660	0	272	72,504	19,835	10,346	92,339	102,685
	February	86	5,694	0	279	16,378	20,404	9,484	36,782	46,266
	March	0	11,616	0	279	9,236	25,072	13,803	38,501	52,304
	April	16,391	5,739	787,920	319	30,027	52,542	26,700	82,569	109,269
	May	79	6,496	2,432,770	606	82,678	56,341	13,220	139,019	152,239
	June	118	6,061	2,724,890	478	98,015	126,418	19,359	224,613	243,972
	July	222	5,951	2,533,940	401	56,239	134,149	11,155	190,415	201,570
	August	687	1,495	361,800	59	65,048	114,060	2,828	179,108	181,936
	September	1,035	3,163	0	720	156,104	153,659	9,891	309,763	319,654
	October	0	297	150,080	0	138,666	58,999	722	197,665	198,387
	November	11,697	5,466	0	5,463	112,403	80,571	29,086	192,974	222,160
	December	4,099	3,357	0	1,433	80,625	66,192	11,836	146,817	158,653
	Total	34,503	62,995	8,991,400	10,309	917,923	908,242	158,430	1,830,565	1,988,995

^aExcludes menhaden.Source: Florida Landings, monthly issues. U.S. Department of Commerce.

Appendix Table 13.--Total landings of selected fish and shellfish species by months, Duval County,
1971-1976.

Year	Month	King whiting	Mutton snapper	Red snapper	Spotted sea trout	Shrimp	Blue crab	Total fish	Total shellfish	Total
-----Pounds-----										
1971	January	25,175	4,363	8,043	2,687	81,774	109,580	170,191	194,154	364,345
	February	76,457	4,921	3,862	798	37,686	93,200	167,393	132,986	300,379
	March	144,747	4,081	3,689	1,418	7,871	90,024	268,859	99,207	368,066
	April	55,671	7,042	9,302	3,642	6,390	22,440	247,445	30,283	277,728
	May	9,315	5,636	11,619	3,309	14,756	127,476	163,609	143,140	306,749
	June	13,490	1,100	8,537	2,362	79,002	161,262	95,089	241,109	336,198
	July	19,744	878	14,087	3,220	103,059	14,852	107,331	119,465	226,796
	August	23,860	2,214	10,697	2,170	76,997	8,756	106,940	86,715	193,655
	September	8,253	4,733	3,013	3,537	107,331	16,805	72,714	124,986	197,700
	October	30,976	6,598	4,608	4,148	176,026	46,973	132,051	224,311	356,362
	November	47,062	5,493	8,605	7,318	268,265	9,468	143,140	277,733	420,873
	December	35,497	10,546	9,313	7,240	284,663	15,783	127,858	302,108	429,966
	Total	490,247	57,605	95,375	42,029	1,243,820	716,619	1,802,620	1,976,197	3,778,817

Appendix Table 13.--Continued.

Year	Month	King whiting	Mutton snapper	Red snapper	Spotted sea trout	Shrimp	Blue crab	Total fish	Total shellfish	Total
-----Pounds-----										
1972	January	14,770	4,767	7,338	6,221	80,511	12,826	116,608	94,999	211,607
	February	19,445	7,541	2,584	5,796	31,458	7,878	123,683	41,436	165,119
	March	128,738	16,077	9,449	5,230	37,871	26,390	228,169	66,892	295,061
	April	80,943	4,575	16,030	18,758	25,031	84,708	229,756	113,655	343,411
	May	10,022	1,550	7,431	10,008	73,344	102,461	95,828	176,505	272,333
	June	9,256	4,463	8,270	4,776	150,164	24,294	75,520	175,070	250,590
	July	22,236	7,033	8,121	4,123	171,238	40,058	86,949	212,171	299,120
	August	33,160	2,088	8,168	6,857	302,221	26,589	96,865	329,598	426,463
	September	21,610	13,092	11,592	6,451	316,966	22,283	133,522	340,824	474,346
	October	25,287	3,973	1,719	6,888	220,067	21,618	169,815	243,060	412,875
	November	54,038	10,186	9,587	5,681	287,696	22,876	235,714	311,697	547,411
	December	46,842	7,055	10,001	10,170	178,007	18,245	159,021	198,800	357,821
	Total	466,347	82,400	100,290	90,959	1,874,574	410,226	1,751,450	2,304,707	4,056,157

Appendix Table 13.--Continued.

Year	Month	King whiting	Mutton snapper	Red snapper	Spotted sea trout	Shrimp	Blue crab	Total fish	Total shellfish	Total
-----Pounds-----										
1973	January	13,115	7,169	7,104	7,492	38,559	6,637	119,240	47,996	167,236
	February	20,939	4,187	6,181	6,384	14,476	5,393	110,936	23,745	134,681
	March	70,836	8,866	4,642	8,909	15,717	9,684	162,635	31,269	193,904
	April	60,103	6,252	3,703	24,405	15,931	20,582	208,400	42,233	250,633
	May	221,638	3,068	13,656	20,062	42,738	17,033	428,700	62,471	491,171
	June	21,113	1,697	14,664	9,200	101,531	17,874	110,650	119,725	230,375
	July	22,865	2,415	6,064	6,488	93,042	24,855	137,717	117,897	255,614
	August	42,883	0	5,802	5,597	105,274	12,802	128,337	118,076	246,413
	September	16,813	6,537	4,352	5,372	154,156	24,207	100,976	178,363	279,339
	October	30,193	18,144	1,367	9,147	221,447	15,514	166,951	236,961	403,912
	November	39,152	13,024	6,393	7,829	213,161	27,523	214,856	240,684	455,540
	December	32,707	0	5,362	4,940	159,750	11,472	107,760	173,957	281,717
	Total	592,357	71,359	79,290	115,825	1,175,782	193,576	1,997,158	1,393,377	3,390,535

Appendix Table 13.--Continued.

Year	Month	King whiting	Mutton snapper	Red snapper	Spotted sea trout	Shrimp	Blue crab	Total fish	Total shellfish	Total
-----Pounds-----										
1974	January	25,441	3,457	12,004	6,541	96,975	11,191	138,920	108,926	247,846
	February	79,951	2,258	4,923	3,971	24,961	5,618	155,784	31,045	186,829
	March	207,218	5,736	11,004	4,352	16,436	14,152	410,232	38,584	448,816
	April	29,706	3,785	6,498	6,101	13,849	10,510	135,944	26,714	162,658
	May	10,756	10,344	13,123	10,153	51,938	16,417	106,241	69,877	176,118
	June	10,410	9,454	6,172	7,113	113,807	14,729	80,223	129,726	209,949
	July	17,032	6,827	8,213	4,612	380,768	28,611	69,722	410,266	479,988
	August	13,404	5,220	12,649	5,347	213,761	17,910	95,617	232,471	328,088
	September	8,524	2,756	4,999	7,722	200,733	14,911	71,998	215,644	287,642
	October	21,787	15,121	8,565	8,229	152,614	16,551	144,084	169,290	313,374
	November	12,249	6,873	7,822	7,642	134,545	16,764	127,638	156,899	284,537
	December	15,712	13,359	16,653	5,698	159,961	11,872	104,863	171,833	276,696
	Total	452,190	85,190	112,625	77,481	1,560,348	179,236	1,641,266	1,761,275	3,402,541

Appendix Table 13.--Continued.

Year	Month	King whiting	Mutton snapper	Red snapper	Spotted sea trout	Shrimp	Blue crab	Total fish	Total shellfish	Total
-----Pounds-----										
1975	January	14,052	8,761	18,009	4,314	41,136	9,126	105,776	57,796	163,572
	February	34,771	7,161	12,160	5,282	12,782	5,512	156,160	20,894	177,054
	March	90,904	3,898	8,967	5,332	17,315	3,883	203,192	24,541	227,733
	April	27,185	5,717	9,216	7,583	21,446	6,379	200,507	29,437	229,944
	May	18,620	367	9,745	8,585	55,480	16,511	111,845	72,553	184,398
	June	28,507	4,267	10,705	5,937	112,593	16,805	124,729	130,251	254,980
	July	19,461	2,484	10,201	5,637	139,273	19,429	109,252	168,515	277,767
	August	14,559	8,305	17,118	4,153	107,092	17,372	154,254	152,239	306,493
	September	13,229	8,063	9,667	3,891	225,802	14,256	126,126	241,606	367,732
	October	27,030	7,330	11,135	5,577	216,749	10,346	181,710	239,601	421,311
	November	29,347	11,404	15,754	7,688	90,527	8,436	191,120	104,763	295,883
	December	17,814	4,527	12,208	4,053	73,935	5,735	116,690	88,241	204,931
	Total	335,479	72,284	144,885	68,032	1,114,130	133,790	1,781,361	1,330,437	3,111,798

Appendix Table 13.--Continued.

Year	Month	King whiting	Mutton snapper	Red snapper	Spotted sea trout	Shrimp	Blue crab	Total fish	Total shellfish	Total
-----Pounds-----										
1976	January	18,503	6,665	15,711	3,682	62,135	5,511	107,555	70,473	178,028
	February	39,604	4,700	18,372	5,080	30,147	4,674	141,534	39,110	180,644
	March	107,297	2,585	22,236	3,273	11,987	4,419	311,475	18,577	330,052
	April	31,894	1,726	11,023	16,380	18,578	7,339	152,967	27,843	180,810
	May	6,359	1,578	9,436	8,674	27,477	6,615	99,585	35,837	135,422
	June	15,062	1,601	10,628	6,998	165,352	11,043	112,313	180,522	292,835
	July	22,361	6,265	12,974	6,561	144,538	14,067	162,198	172,398	334,596
	August	9,782	148	3,120	2,261	144,848	12,325	53,722	158,984	212,706
	September	21,548	2,364	7,951	5,624	140,454	18,250	115,038	174,332	289,370
	October	16,566	2,408	6,371	5,794	150,737	31,825	115,388	193,215	308,603
	November	24,831	691	10,275	8,097	137,922	30,212	115,403	170,054	285,457
	December	12,220	485	24,571	8,414	63,622	6,171	91,114	74,226	165,340
	Total	326,027	31,216	152,668	80,838	1,097,797	152,451	1,578,292	1,315,571	2,893,863

Source: Florida Landings, monthly issues. U.S. Department of Commerce.

Appendix Table 14. Average monthly landings of fish and shellfish for major North Florida counties from 1971 to 1976

Month	Escambia			Bay			Gulf			Franklin			Wakulla		
	Fish	Shellfish	Total	Fish	Shellfish	Total	Fish	Shellfish	Total	Fish	Shellfish	Total	Fish	Shellfish	Total
-----1,000 pounds-----															
January	265.3	46.0	311.3	215.2	77.3	292.5	68.3	45.5	113.8	115.6	732.2	847.8	80.4	188.1	268.5
February	238.9	63.1	302.0	240.0	75.1	315.1	29.7	26.8	56.5	100.1	641.2	741.3	63.0	263.2	326.2
March	203.5	77.7	281.2	247.6	82.3	329.9	57.5	42.3	99.8	103.5	747.2	850.7	94.5	261.5	356.0
April	257.4	76.8	334.2	323.5	132.6	456.1	247.8	59.2	307.0	120.9	873.2	994.1	134.3	350.8	485.1
May	274.5	80.7	355.2	821.7	167.5	989.2	437.8	86.9	524.7	161.4	908.7	1,070.1	77.0	419.3	496.3
June	284.7	84.8	369.5	689.1	156.4	845.5	447.6	73.7	521.3	183.4	603.8	787.2	125.5	405.2	530.7
July	316.4	124.7	441.1	621.6	171.0	792.6	347.8	66.1	413.9	192.1	540.5	732.6	117.1	320.3	437.4
August	381.9	126.1	508.0	588.8	159.7	748.5	334.8	60.8	395.6	160.8	356.6	517.4	132.5	192.9	325.4
September	303.5	93.1	396.6	614.0	129.4	743.4	283.4	55.5	338.9	140.2	560.3	700.5	151.9	177.5	329.4
October	467.2	89.9	557.1	876.6	156.8	1,033.4	585.7	68.5	654.2	216.9	601.1	818.0	209.8	234.4	444.2
November	351.5	99.8	451.3	566.6	153.2	719.8	493.5	46.3	539.8	196.8	659.1	855.9	200.8	126.7	327.5
December	278.0	81.0	359.0	320.9	101.6	422.5	153.6	48.3	201.9	108.4	607.5	715.9	114.9	154.9	269.8

Month	Four County Total			Nassau			Duval			Two County Total		
	Fish	Shellfish	Total	Fish ^a	Shellfish	Total	Fish	Shellfish	Total	Fish ^a	Shellfish	Total
-----1,000 pounds-----												
January	479.5	1,043.1	1,522.6	10.9	94.5	105.4	126.4	95.7	222.1	137.3	190.2	327.5
February	432.8	1,006.3	1,439.1	8.5	39.5	48.0	142.6	48.2	190.8	151.1	87.7	238.8
March	503.1	1,133.3	1,636.4	17.0	44.8	61.8	264.1	46.5	310.6	281.1	91.3	372.4
April	826.5	1,415.8	2,242.3	10.0	71.1	81.1	195.8	45.0	240.8	205.8	116.1	321.9
May	1,497.9	1,582.4	3,080.3	13.4	148.5	161.9	167.6	93.4	261.0	181.0	241.9	422.9
June	1,445.6	1,239.1	2,684.7	9.3	177.8	187.1	99.8	162.7	262.5	109.1	340.5	449.6
July	1,278.6	1,097.9	2,376.5	18.6	149.7	168.3	112.2	200.1	312.3	130.8	349.8	480.6
August	1,216.9	770.0	1,986.9	15.7	138.1	153.8	106.0	179.7	285.7	121.7	317.8	439.5
September	1,189.5	922.7	2,112.2	11.9	218.3	230.2	103.4	212.6	316.0	115.3	430.9	546.2
October	1,889.0	1,060.8	2,949.8	15.1	241.0	256.1	151.7	217.7	369.4	166.8	458.7	625.5
November	1,457.7	985.3	2,443.0	15.9	215.7	231.6	171.3	210.3	381.6	187.2	426.0	613.2
December	697.8	912.3	1,610.1	9.4	151.5	160.9	117.9	168.2	286.1	127.3	319.7	447.0

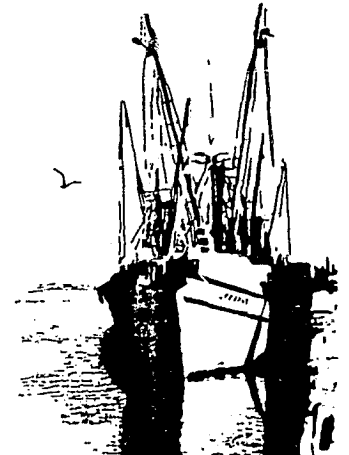
^aExcludes menhaden.Source: Derived from Florida Landings, Monthly issues, U.S. Department of Commerce,ORIGINAL PAGE IS
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APPENDIX B

QUESTIONNAIRES

Detailed Summary of Questionnaire Disposition

FLORIDA SEAFOOD PORT STUDY



Dear Commercial Boat Owner:

Are commercial fishing facilities adequate in your area? The Gulf and South Atlantic Fisheries Development Foundation and your industry associations have asked us to determine the need for new or improved port facilities and possible locations for them.

Your opinions are important to us. Even if you are not engaged in commercial fishing, please complete the part of the form that pertains to you and return it to us today -- it will only take a few minutes. Your answers will show whether or not a commercial fishing port is needed. We are not promoting a port, but are only asking for your views and opinions.

Your prompt attention is appreciated.

Sincerely,

Jim Cato
James C. Cato
Marine Economist

Fred J. Prochaska
Fred J. Prochaska
Marine Economist

JCC:FSP:pb

A Cooperative Project of
Florida Agricultural Market Research Center
Gulf & South Atlantic Fisheries Development Foundation, Inc.
Coastal Plains Regional Commission

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COMMERCIAL FISHERMAN SURVEY

1. You owned a commercial fishing boat in 1975 according to state boat registration records. Do you still own one or more commercial boats?
☐ Yes --- Please continue ☐ No --- If no, please return today so we will know you received the questionnaire (NO POSTAGE REQUIRED). Thank you.
2. Do you use your boat for commercial fishing?
☐ Yes --- Please continue ☐ No --- If no, please return today so we will know you received the questionnaire (NO POSTAGE REQUIRED). Thank you
 A. In column A, check and rate the facilities and services that you now use.
 B. In column B, check which facilities or services you would use if available or improved.

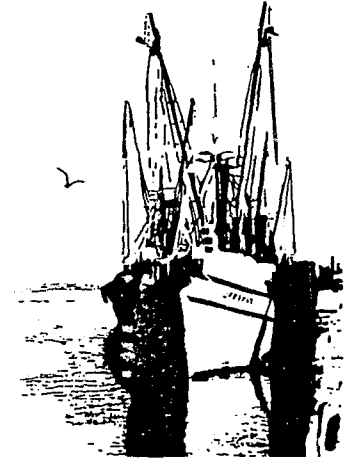
Facilities or services	Check only those you use	Column A		Column B		Comments
		OK	Rating Needs improving	Check those you would use if available or improved		
1. Shrimp unloading house	☐	☐	☐	☐	☐	
2. Crab unloading	☐	☐	☐	☐	☐	
3. Oyster shucking house	☐	☐	☐	☐	☐	
4. Fish house	☐	☐	☐	☐	☐	
5. Processing of unused fish	☐	☐	☐	☐	☐	
6. Bait sales and supply	☐	☐	☐	☐	☐	
7. Ducking facilities	☐	☐	☐	☐	☐	
8. Freezer and cold storage	☐	☐	☐	☐	☐	
9. Ice house	☐	☐	☐	☐	☐	
10. Gear storage area	☐	☐	☐	☐	☐	
11. Gear supply	☐	☐	☐	☐	☐	
12. Gear repair service	☐	☐	☐	☐	☐	
13. Electronics service	☐	☐	☐	☐	☐	
14. Engine repair service	☐	☐	☐	☐	☐	
15. Marine railway	☐	☐	☐	☐	☐	
16. Fuel sales	☐	☐	☐	☐	☐	
17. Groceries	☐	☐	☐	☐	☐	
18. Restaurant	☐	☐	☐	☐	☐	
19. Retail seafood market	☐	☐	☐	☐	☐	
20. Fishermens' meeting room	☐	☐	☐	☐	☐	
21. Liquid waste disposal	☐	☐	☐	☐	☐	
22. Solid waste disposal	☐	☐	☐	☐	☐	
23. Other (list)	☐	☐	☐	☐	☐	
	☐	☐	☐	☐	☐	
	☐	☐	☐	☐	☐	
	☐	☐	☐	☐	☐	

3. Check if you are also a dealer or a supplier
4. What Florida port do you use most?
5. How far is it from your home to this port? Miles
6. On the average, how far is this port from your usual fishing grounds? Miles
7. How many pounds did you sell in 1976? (CONFIDENTIAL)

FISH	SHELLFISH
☐ 0 - 5,000 lbs	☐ 0 - 5,000 lbs
☐ 5,000 - 10,000 lbs	☐ 5,000 - 10,000 lbs
☐ 10,000 - 25,000 lbs	☐ 10,000 - 25,000 lbs
☐ 25,000 or more	☐ 25,000 or more

Comments

FLORIDA SEAFOOD PORT STUDY



Dear Seafood Dealer:

Are commercial fishing facilities adequate in your area? The Gulf and South Atlantic Fisheries Development Foundation and your industry associations have asked us to determine the need for new or improved port facilities and possible locations for them.

Your opinions are important to us. Even if you are not now a seafood dealer, please complete the part of the form that pertains to you and return it to us today. It will only take a few minutes. Your answers will show whether or not a commercial fishing port is needed. We are not promoting a port, but are only asking for your views and opinions.

Your prompt attention is appreciated.

Sincerely,

Jim Cato

James C. Cato
Marine Economist

Fred J. Prochaska

Fred J. Prochaska
Marine Economist

JCC:FJP:pb

A Cooperative Project of
Florida Agricultural Market Research Center
Gulf & South Atlantic Fisheries Development Foundation, Inc.
Coastal Plains Regional Commission

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145

SEAFOOD DEALER - PROCESSOR SURVEY

1. You were a seafood dealer and/or processor in 1976 according to our records. Are you still in this business?

☐ Yes ----- please continue

☐ No ----- if no, please return today so we will know you received the questionnaire.
(NO POSTAGE REQUIRED).
Thank you.

2. If you are in the seafood business please check the most important products you handle.

FISH

- ☐ Croaker
- ☐ Grouper
- ☐ Spanish mackerel
- ☐ King mackerel
- ☐ Pompano
- ☐ Red snapper
- ☐ Spot
- ☐ Sea trout
- ☐ King whiting
- ☐ Bass
- ☐ Other fish (list)

SHELLFISH

- ☐ Blue crabs
- ☐ Oysters
- ☐ Scallops
- ☐ Shrimp
- ☐ Other shellfish (list)

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3. Please complete the following about your seafood business.
- A. In column A, check the facilities and services you now offer. Then,
- B. In column B, check the facilities and services you would like added or improved.

Facilities or services	Column A Those you now offer	Column B Those you would like added or improved
1. Shrimp unloading house	☐	☐
2. Crab unloading	☐	☐
3. Oyster shucking house	☐	☐
4. Fish house	☐	☐
5. Processing of unused fish	☐	☐
6. Bait sales and supply	☐	☐
7. Docking facilities	☐	☐
8. Freezer and cold storage	☐	☐
9. Ice house	☐	☐
10. Gear storage area	☐	☐
11. Gear supply	☐	☐
12. Gear repair service	☐	☐
13. Electronics service	☐	☐
14. Engine repair service	☐	☐
15. Marine railway	☐	☐
16. Fuel sales	☐	☐
17. Groceries	☐	☐
18. Restaurant	☐	☐
19. Retail seafood market	☐	☐
20. Liquid waste disposal	☐	☐
21. Solid waste disposal (shrimp heads, fish, scrap, etc.)	☐	☐
22. Other (list)	☐	☐

Comments.

4. What other items are needed to improve your seafood business, or to help you meet government requirements?

Needed improvements	Check all that apply
More seafood from fishermen	☐
More workers	☐
Better trained workers	☐
Better roads or trucking	☐
Financial assistance to meet sanitation or pollution control requirements	☐
Others (list)	

5. How many pounds did you sell in 1976?
(CONFIDENTIAL)

FISH	SHELLFISH
☐ Under 50,000 lbs	☐ Under 50,000 lbs
☐ 50,000-100,000 lbs	☐ 50,000-100,000 lbs
☐ 100,000-300,000 lbs	☐ 100,000-300,000 lbs
☐ Over 300,000 lbs	☐ Over 300,000 lbs

Mail Survey Procedures and Responses

Each of the two questionnaires shown previously was sent to boat owners or to seafood dealers, as appropriate, in the 23-county area of north Florida in September, 1977. The questionnaire to commercial boat owners was sent to 3,596 holders of 1975 Florida commercial boat registrations listed with the Florida Department of Natural Resources. A total of 180 received the dealer questionnaire. A second copy of the appropriate questionnaire was sent to those who had not responded in each group approximately four weeks after the first mailing.

The response from commercial boat owners, considered to be fishermen in this study, was about 8 percent from the first mailing, with much higher returns from the second questionnaire. Total return was 1,134 completed questionnaires from fishermen or about 32 percent of the initial number mailed. Of the 1,134 respondents, 507 were still active commercial fishermen (Appendix Table 15).

It is assumed that boat owners not replying after the second mailing were or were not active commercial fishermen in the same proportion as boat owners returning questionnaires. Applying the percentage that active fishermen in each county are of respondents from the county to total county boat registrations gives an estimated 1,807 active commercial fishermen in the 23-county region. Franklin County has the largest number of fishermen with 291 followed by 235 in Duval (Appendix Table 16). The seven counties chosen for detailed study contained 2,297 or 64 percent of the boat owners receiving questionnaires, and 274 or 54 percent of

active commercial fishermen responding (Appendix Table 15). These seven counties had 1,034 commercial fishermen, 57 percent of the estimated total in the region.

Just over one-fourth of the 180 dealers in the 23 counties returned questionnaires. Of the 47 returned, 41 were still in business (Appendix Table 17). The seven major counties had 71 percent of the dealers receiving questionnaires and 78 percent of dealers still in business.

Appendix Table 15.--Questionnaires mailed and responses or disposition, commercial fishermen, all counties and seven major counties.

	All counties		Seven major counties		Major counties as a share of total
	Number	Percent	Number	Percent	Percent
Total mailed	3,596	100	2,297	100	64
Unable to deliver	401	11	230	10	57
Individuals receiving questionnaires	3,195	89	2,067	90	
Questionnaires not returned	2,060	57	1,452	63	70
Questionnaires returned	1,135	32	615	27	54
Respondents:					
No longer fishing	628 ^a	18	341 ^a	15	54
Still active	507	14	274	12	54

^aNo longer commercial fishing but had commercial boat registration.

Appendix Table 16.-- Questionnaires sent, questionnaires returned, and estimated total number of active commercial fishermen, 23 Coastal Plains counties, 1977.

County	Questionnaires				Estimated total active commercial fishermen
	Sent	Returned			
		Total	Active		
	Number		Percent		Number
Bay ^a	422	138	47 34		144
Calhoun	15	9	2 22		3
Citrus	317	99	48 48		154
Clay	116	37	22 59		69
Dixie	134	33	16 48		65
Duval ^a	477	136	67 49		235
Escambia ^a	389	104	46 44		174
Flagler	9	3	0 0		0
Franklin ^a	624	133	62 47		291
Gulf ^a	95	28	12 43		41
Hernando	26	8	4 50		13
Jefferson	2	1	0 0		0
Levy	196	54	21 39		76
Liberty	13	6	2 33		4
Nassau ^a	106	27	17 63		67
Okaloosa	173	62	33 53		92
Putnam	245	58	23 40		97
St. Johns	127	30	17 57		72
Santa Rosa	122	38	11 29		35
Taylor	143	49	25 51		73
Wakulla ^a	175	49	23 47		82
Walton	55	24	8 33		18
Washington	15	8	1 12		2
Total	3,996	1,134	507 45		1,807

^aCounties included in this report.

Appendix Table 17.--Questionnaires sent and returned by seafood dealers in the 23 Coastal Plains counties, 1977.

County	Questionnaires		
	Sent	Returned	
		Total	Current dealer
Bay ^a	23	11	10
Calhoun	0	0	0
Citrus	6	2	2
Clay	2	0	0
Dixie	4	0	0
Duval ^a	11	4	3
Escambia ^a	12	5	4
Flagler	0	0	0
Franklin ^a	54	6	6
Gulf ^a	6	3	3
Hernando	0	0	0
Jefferson	0	0	0
Levy	7	1	0
Liberty	0	0	0
Nassau ^a	8	2	2
Okaloosa	7	2	2
Putnam	4	1	1
St. Johns	6	1	1
Santa Rosa	5	1	0
Taylor	6	2	2
Wakulla ^a	14	5	4
Walton	5	1	1
Washington	0	0	0
Total	180	47	41

^aCounties included in this report.

Appendix Table 18.--Distance from home to fishing port traveled by commercial fishermen responding in the seven major counties.

County	Under 1 Mile		1-3 Miles		4-6 Miles		7-10 Miles		Over 10 Miles		Total	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent ^a
Escambia	9	20	9	20	9	20	11	24	8	17	46	100
Bay	9	21	8	19	4	9	12	28	10	23	43	100
Gulf	2	18	5	45	1	9	2	18	1	9	11	100
Franklin	21	36	30	51	4	7	0	0	4	7	59	100
Wakulla	2	10	4	20	5	25	0	0	9	45	20	100
Nassau	4	29	3	21	1	7	4	29	2	14	14	100
Duval	11	18	11	18	7	12	7	12	24	40	60	100
Total	58	23	70	28	31	12	36	14	58	23	253	100

^aPercentage may not sum to 100 due to rounding.

Appendix Table 19.--Distance from fishing port to fishing grounds traveled by commercial fishermen responding in the seven major counties.

County	Under 10 Miles		11-25 Miles		26-50 Miles		51-75 Miles		Over 75 Miles		Total	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent ^a
Escambia	17	38	7	16	11	24	2	4	8	18	45	100
Bay	16	36	8	18	9	20	4	9	7	16	44	100
Gulf	3	33	2	22	4	44	0	0	0	0	9	100
Franklin	34	58	15	25	4	7	3	5	3	5	59	100
Wakulla	9	43	2	10	4	19	4	19	2	10	21	100
Nassau	8	62	3	23	0	0	1	8	1	8	13	100
Duval	31	53	12	21	5	9	7	12	3	5	58	100
Total	118	47	49	20	37	15	21	8	24	10	249	100

^aPercentages may not sum to 100 due to rounding.

Appendix Table 20.--Classification of commercial fishermen in the seven major counties by volume of fish sold in 1976.

County	Pounds sold									
	Under 5,000		5,000-10,000		10,000-25,000		Over 25,000		Total	
	<u>Number</u>	<u>Percent</u>	<u>Number</u>	<u>Percent</u>	<u>Number</u>	<u>Percent</u>	<u>Number</u>	<u>Percent</u>	<u>Number</u>	<u>Percent</u> ^a
Escambia	16	46	6	17	6	17	7	20	35	100
Bay	17	49	6	17	4	11	8	23	35	100
Gulf	4	67	0	0	1	17	1	17	6	100
Franklin	20	65	3	10	1	3	7	23	31	100
Wakulla	7	58	2	17	2	17	1	8	12	100
Nassau	3	75	0	0	0	0	1	25	4	100
Duval	22	50	9	20	7	16	6	14	44	100
Total	89	53	26	16	21	13	31	19	167	100

^aPercentages may not sum to 100 due to rounding.

Appendix Table 21.--Classification of commercial fishermen in the seven major counties by volume of shellfish sold in 1976.

County	Pounds sold									
	Under 5,000		5,000+10,000		10,000-25,000		Over 25,000		Total	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent ^a
Escambia	3	25	3	25	1	8	5	42	12	100
Bay	5	45	3	27	2	18	1	9	11	100
Gulf	4	67	0	0	1	17	1	17	6	100
Franklin	13	37	3	9	2	6	17	49	35	100
Wakulla	4	36	0	0	2	18	5	45	11	100
Nassau	1	11	1	11	4	44	3	33	9	100
Duval	15	54	7	25	2	7	4	14	28	100
Total	45	40	17	15	14	13	36	32	112	100

^aPercentages may not sum to 100 due to rounding.

APPENDIX C

Appendix Table 22.-- Factors used in estimating port facility requirements and capacities

Item	Factor
Freezer space	30.4 cubic feet per 1,000 lbs.; unit 10.5 feet high, 60% total space effective. At -40°F, 14 hours freezing time for fish, shrimp.
Cold storage	
Frozen	30.4 cubic feet per 1,000 lbs.; unit 30 feet high, 70% total space effective. Holding at -5° to -10°F.
Above freezing	36.1 cubic feet per 1,000 lbs.; unit 12 feet high, 70% total space effective. Holding standard shrimp or fish boxes (26x16x15 in) with ice, at 33° to 34°F. Calculate space for 3 days catch at peak volume.
Ice plant	
Manufacturing	Water cooled plant. 1.749 lbs. ice per lb. fish landed; 4.887 lbs. ice per lb. shrimp landed; .25 lbs. ice per lb. fish marketed, .3 lbs. ice per lb. shrimp marketed.
Storage	34 lbs. ice per cubic foot. Store 2 1/2 days manufacture.
Fuel storage	Require .8 gallons diesel fuel per lb. of landings; tank capacities taken from Georgia study (Coastal Area Planning and Development Commission).
Docking	Vessel length plus 10 feet for vessels 30 feet and over; plus 5 feet for vessels under 30 feet in length. See Appendix Table 23 for numbers and sizes of vessels used for each port.
Gear storage	100 square feet per vessel for all vessels using port, except for 50 feet and longer fishing boats, where 300 square feet was allowed.
Capital costs	Annual cost figured using 30 years, and 10 percent interest rate.

Appendix Table 23.-- Vessel numbers and lengths used in estimating
facility requirements for ports.

Port	Vessel type	Total vessels	Average length Feet	Vessels in port	
				Unloading	Berthing
Pensacola	Shrimper - bay	80	40	20	40
	Shrimper - gulf	80	75	20	40
	Snapper - grouper	65	50	22	33
	Net - bait	35	30	18	25
Panama City	Shrimper - bay	60	40	15	30
	Shrimper - gulf	55	75	15	30
	Snapper - grouper	60	50	20	30
	Net - bait	40	30	20	30
Port St. Joe	Shrimper - bay	25	40	6	12
	Shrimper - gulf	25	75	6	13
	Fishing	20	40	10	10
Apalachicola	Shrimper - bay	33	40	8	16
	Shrimper - gulf	32	75	8	16
	Net - bait	25	25	12	25
	Oyster	80	25	20	10
Eastpoint	Oyster	100	25	25	15
Carrabelle	Shrimper - bay	85	40	21	42
	Shrimper - gulf	85	75	21	42
	Snapper - grouper	25	50	8	12
Panacea	Crab	100	25	25	--
	Net - bait	50	25	--	--
	Shrimper - bay	3	40	1	--
	Shrimper - gulf	2	75	1	--
Fernandina	Shrimper - river	8	40	2	4
	Shrimper - offshore	7	55	2	4
	Net - bait	20	40	10	10
Mayport	Shrimper - river - bay	35	40	9	18
	Shrimper - offshore	35	55	9	18
	Net - bait	100	40	25	40
	Snapper - grouper	30	50	10	15

Appendix Table 24.--Estimated annual revenue and expense for improved port facilities, five-year projection, Pensacola.

Item	Amount	Unit cost	Annual revenue, years		
			1	2	3-5
-----Dollars-----					
Revenue					
Space rental					
Docks - unloading	3,740 ft.	1.50/mo.	40,392	53,856	67,320
Docks - berthing	8,380 ft.	1.50/mo.	67,878	90,504	113,130
Gear storage	10,000 sq. ft.	.05/mo.	2,400	3,200	4,000
Total space			110,670	147,560	184,450
Sales					
Ice	60 tons/day	.50	4,680	6,240	7,800
Fuel	2,968,800 gal.	.02	35,626	47,501	59,376
Total sales			40,306	53,741	67,176
Total revenue			150,976	201,301	251,626
Expense					
Maintenance & repair			45,733	45,733	45,733
Administration			48,000	64,000	80,000
Utilities			7,200	9,600	12,000
Total			100,933	119,333	137,733
Capital charge			487,765	487,765	487,765
Total expense			588,698	607,098	625,498

Appendix Table 25.--Estimated annual revenue and expense for improved port facilities, five-year projection, Panama City.

			Annual revenue, years		
Item	Amount	Unit cost	1	2	3-5
-----Dollars-----					
Revenue					
Space rental					
Docks - unloading	3,000 ft.	1.50/mo.	32,500	43,200	54,000
Docks - berthing	7,050 ft.	1.50/mo.	57,105	76,140	95,175
Gear storage	10,000 sq. ft.	.50/mo.	2,400	3,200	4,000
Total			91,905	122,540	153,175
Sales					
Fuel	5,967,200 gal.	.02	71,606	95,475	119,344
Total sales			71,606	95,475	119,344
Total revenue			163,511	218,015	272,519
Expense					
Maintenance & repair			35,750	35,750	35,750
Administration			42,000	56,000	70,000
Utilities			6,300	8,400	10,500
Total			84,050	100,150	116,250
Capital charge			381,295	381,295	381,295
Total expense			465,345	481,445	497,545

Appendix Table 26.--Estimated annual revenue and expense for improved port facilities, five-year projection, Port St. Joe.

			Annual revenue, years		
Item	Amount	Unit cost	1	2	3-5
Revenue			-----Dollars-----		
Space Rental					
Docks - unloading	1,175 ft.	1.50/mo.	12,690	16,920	21,150
Docks - berthing	2,100 ft.	1.50/mo.	17,010	22,680	29,350
Gear storage	12,500 sq. ft.	.05/mo.	3,000	4,000	5,000
Total space			32,700	43,600	54,500
Sales					
Ice	30 tons/day	.50	2,340	3,120	3,900
Fuel	3,798,400 gal.	.02	45,581	60,774	75,968
Total sales			47,921	63,894	79,868
Total revenue			80,621	107,494	134,368
Expense					
Maintenance & repair			15,394	15,394	15,394
Administration			12,000	16,000	20,000
Utilities			1,800	2,400	3,000
Total			29,194	33,794	38,394
Capital charge			164,184	164,184	164,184
Total expense			193,378	197,978	202,578

Appendix Table 27.--Estimated annual revenue and expense for improved port facilities, five-year projection, Apalachicola.

Item	Amount	Unit cost	Annual revenue, years		
			1	2	3-5
-----Dollars-----					
Revenue					
Space rental					
Docks - unloading	1,200 ft.	1.50/mo.	12,960	17,280	21,600
Docks - berthing	2,310 ft.	1.50/mo.	18,711	24,948	31,185
Gear storage	9,000 sq. ft.	.50/mo.	2,160	2,880	3,600
Total			<u>33,831</u>	<u>45,108</u>	<u>56,385</u>
Total revenue			<u>33,831</u>	<u>45,108</u>	<u>56,385</u>
Expense					
Maintenance & repair			13,838	13,838	13,838
Administration			28,800	38,400	48,000
Utilities			4,320	5,760	7,200
Total			<u>46,958</u>	<u>57,998</u>	<u>69,038</u>
Capital charge			<u>147,585</u>	<u>147,585</u>	<u>147,585</u>
Total expense			<u>194,543</u>	<u>205,583</u>	<u>216,623</u>

Appendix Table 28.--Estimated annual revenue and expense for improved port facilities, five-year projection, Eastpoint.

Item	Amount	Unit cost	Annual revenue, years		
			1	2	3-5
Revenue			<u>Dollars</u>		
Space rental					
Docks - unloading	750 ft.	1.50/mo.	8,100	10,800	13,500
Docks - berthing	450 ft.	1.50/mo.	3,645	4,860	6,075
Total space			<u>11,745</u>	<u>15,660</u>	<u>19,575</u>
Total revenue			11,745	15,660	19,575
Expense					
Maintenance & repair			5,250	5,250	5,250
Administration			15,000	20,000	25,000
Utilities			2,250	3,000	3,750
Total			<u>22,500</u>	<u>28,250</u>	<u>34,000</u>
Capital charge			<u>55,994</u>	<u>55,994</u>	<u>55,994</u>
Total expense			78,494	84,244	89,994

Appendix Table 29.--Estimated annual revenue and expense for improved port facilities, five-year projection, Carrabelle.

			Annual revenue, years		
	Amount	Unit cost	1	2	3-5
-----Dollars-----					
Revenue					
Space rental					
Docks - unloading	2,865 ft.	1.50/mo.	30,942	41,256	51,570
Docks - berthing	5,890 ft.	1.50/mo.	47,709	63,612	79,515
Gear storage	19,500 sq. ft.	.05/mo.	4,680	6,240	7,800
Total			83,331	111,108	138,885
Sales					
Ice	30 tons/day	.50	2,340	3,120	3,900
Fuel	2,000,000 gal.	.02	24,000	32,000	40,000
Total			26,340	35,120	43,900
Total revenue			109,671	146,228	182,785
Expense					
Maintenance & repair			35,301	35,301	35,301
Administration			30,000	40,000	50,000
Utilities			4,500	6,000	7,500
Total			69,801	81,301	92,801
Capital charge			376,509	376,509	376,509
Total expenses			446,310	457,810	469,310

Appendix Table 30.--Estimated annual revenue and expense for improved port facilities, five-year projection, Panacea.

			Annual revenue, years		
Item	Amount	Unit cost	1	2	3-5
			<u>-----Dollars-----</u>		
Revenue					
Space Rental					
Docks - unloading	700 ft.	1.50/mo.	7,560	10,080	12,600
Docks - berthing	800 ft.	1.50/mo.	6,480	8,640	10,800
Gear storage	3,000 sq. ft.	.05/mo.	720	960	1,200
Total space rental			14,760	19,680	24,600
Sales					
Ice	10 tons/day	.50	780	1,040	1,300
Fuel	765,600 gal.	.02	9,079	12,250	15,312
Total			9,859	13,290	16,612
Total revenue			24,619	32,970	41,212
Expense					
Maintenance & repair			7,400	7,400	7,400
Administration			19,200	25,600	32,000
Utilities			2,880	3,840	4,800
Total			29,480	36,840	44,200
Capital charge			78,925	78,925	78,925
Total expense			108,405	115,765	123,125

Appendix Table 31.--Estimated annual revenue and expense for improved port facilities, five-year projection, Fernandina Beach.

Item	Amount	Unit cost	Annual revenue, years		
			1	2	3-5
			-----Dollars-----		
Revenue					
Space rental					
Docks - unloading	770 ft.	1.50/mo.	8,316	11,088	13,860
Docks - berthing	300 ft.	1.50/mo.	2,430	3,240	4,050
Gear storage	900 sq. ft.	.05/mo.	216	288	360
Total space			10,962	14,616	18,270
Sales					
Ice	12 tons/day	.50	936	1,248	1,560
Fuel	860,800	.02	10,330	13,773	17,216
Total sales			11,266	15,021	18,776
Total revenue			22,228	29,637	37,046
Expense					
Maintenance & repair			6,219	6,219	6,219
Administration			24,000	32,000	40,000
Utilities			3,600	4,800	6,000
Total			33,819	43,019	52,219
Capital charge			66,327	66,327	66,327
Total expense			100,146	109,346	118,546

Appendix Table 32.--Estimated annual revenue and expense for improved port facilities, five-year projection, Mayport.

			Annual revenue, years		
Item	Amount	Unit cost	1	2	3-5
			-----Dollars-----		
Revenue					
Space rental					
Docks - unloading	2,465 ft.	1.50/mo.	26,622	35,496	44,370
Docks - berthing	3,930 ft.	1.50/mo.	31,833	42,444	53,055
Total			58,455	77,940	97,425
Sales					
Fuel	2,140,800 gal.	.02	25,690	34,253	42,816
Total			25,690	34,253	42,816
Total revenue			84,145	112,193	140,241
Expense					
Maintenance & repair			23,383	23,383	23,383
Administration			31,800	42,400	53,000
Utilities			4,770	6,360	7,950
Total			59,953	72,143	84,333
Capital charge			249,338	249,338	249,338
Total expense			309,291	321,481	333,671

Appendix Table 33. Vessel numbers used to develop industrial port costs, 1978.

Vessel length	Vessels			
	Total	Unloading ^a	Berthing ^a	Service ^b
<u>Feet</u>				
100	50	5	15	5
60-75	180	23	45	15
40-59	300	50	100	35
25-39	70	18	40	10
Total	600	95	200	65

^aNumber of vessels of each size in port at any given time.

^bNumber of vessels receiving fuel and/or ice at any given time.

Appendix Table 34. Landings volume and distribution as fresh or frozen used to develop industrial port costs, 1978.

Type	Amount		
	Total	Fresh	Frozen
	-----Million pounds-----		
Finfish	20	12	8
Shrimp	5	1	4
Blue crab	5	1	4
Total	30	14	16

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REMOTE SENSING EVALUATION OF PORT SITES

A Report by
H. K. Brooks, J. D. Degner and B. E. Ruth

a remote sensing site evaluation study of seven seaport locations in the panhandle of Florida. This report provides supplemental information to the report, Commercial Fishing Port Development in North Florida, prepared by the Florida Agricultural Market Research Center, Institute of Food and Agricultural Sciences, University of Florida.

NASA Grant NSG No. 7236

August, 1978

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REMOTE SENSING EVALUATION OF PORT SITES

H. K. Brooks, J. D. Degner and B. E. Ruth

The Florida Agricultural Market Research Center (FAMRC) was commissioned by the Gulf and South Atlantic Fisheries Development Foundation, Inc., to evaluate commercial fishing and seafood marketing activities in northern Florida. The stated objective of the FAMRC study was "to investigate the need for a modern seafood port in north Florida and/or the needs for improving existing ports". Analysis of the seafood port facilities was conducted by FAMRC.

The Remote Sensing Applications Laboratory was requested to evaluate selected areas for the purpose of making specific recommendations for the location of improvements, using remote sensing techniques and available data. Seven port areas in five Gulf coast counties were determined to need improvements that could be analyzed by such techniques. The identified needs for each port, as determined by FAMRC, are listed in Table 51. The location of these seven areas appear on Figure 21.

The data and opinions presented in this report are based primarily upon the interpretation of aerial photographs and satellite imagery, with supplemental information derived from a low level overflight, cursory site visits on the ground, and data from the literature. Advantages and disadvantages of potential sites for the port improvements recommended in the FAMRC study are discussed. The recommendations set forth in this report should be considered only as a guide to the development of the detailed geotechnical data needed to properly plan and construct the needed marine facilities. The results in this report can form the basis for detailed

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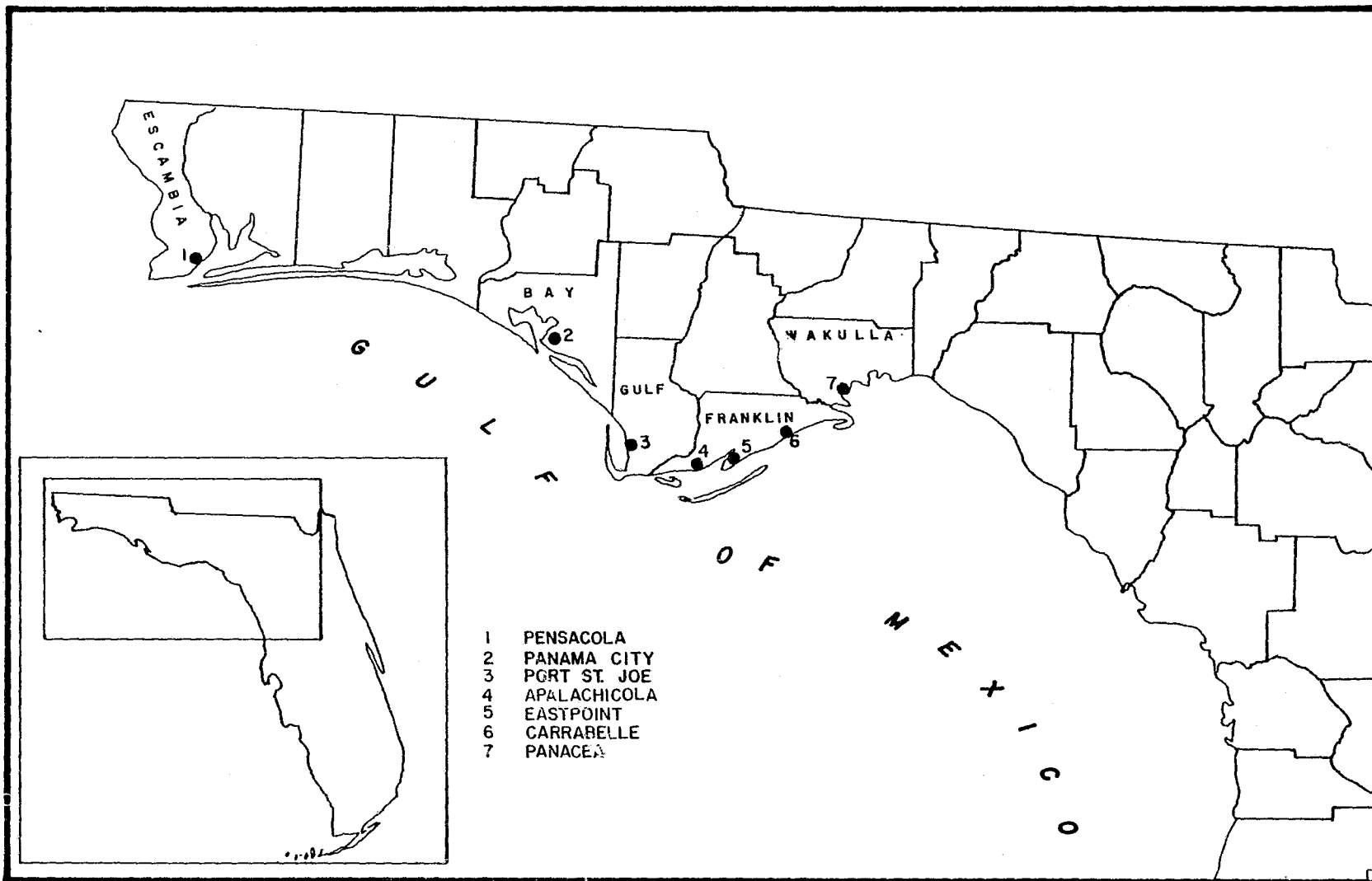


Figure 21.--Areas evaluated for fishing port development in north Florida.

studies to be used in the selection of specific sites for expansion or development. A limited glossary of technical terms has been provided and is located at the back of this report.

A grant from the Office of Space and Terrestrial Applications, National Aeronautics and Space Administration, and support from FAMRC made this portion of the study possible.

Table 51.--Selected fishing port facility needs in five north Florida counties.

County ^a	Port	Identified needs
Escambia	Pensacola	Docking
Bay	Panama City	Docking, breakwater
Gulf	Port St. Joe	Docking, channel
Franklin	Apalachicola	Docking, channel
Franklin	Eastpoint	Breakwater
Franklin	Carrabelle	Docking
Wakulla	Panacea	Docking, channel

^aNassau and Duval counties not included because identified needs could not be assessed by remote sensing techniques.

Source: Commercial Fishing Port Development in North Florida, Industry Report 78-6, Florida Agricultural Market Research Center, University of Florida.

Procedure

The selection and evaluation of potential sites involve both marine- and shore-related considerations. Marine-related factors such as access from the sea, depth and stability of navigational channels, storm protection, obstructions such as bridges, and potential space for basin and dock facilities must be examined. Knowledge of bathymetry, bottom conditions, and adjacent land elevations are essential considerations that may make the cost of initial dredging and construction and subsequent maintenance prohibitive.

The easiest, most reliable, and economical method used to evaluate such factors as listed above is with remote sensing and air photo interpretation techniques. Natural and cultural features, spatial relationships, and dynamic changes can be determined, especially with time

sequential photography. For the port study, most of the pertinent information could be readily observed and interpreted using these tools.

Various satellite images, color infrared photographs, and black and white photographs were collected and analyzed for this study. Topographic maps, nautical charts, and previous site studies were also examined. Coastal Zone Management Atlases were used to verify and determine present land use and support services. The atlases offer biophysical and socio-economic analyses, as well as information on environmental quality.

After initial data analyses, a low altitude aerial survey of the study areas, excluding Pensacola, was conducted by members of the laboratory. A cursory two day ground survey was conducted as a field check.

The Gulf Coast of Northern Florida

History and Physiography

The panhandle of Florida extends from St. Marks to the Alabama state line. This is an east-west distance of approximately 150 miles. The seven study locations are separated by distances ranging from less than 10 to about 100 miles.

The occurrence of diastrophic events and eustatic fluctuations of sea level are two main factors responsible for shaping the land. Tectonic records reveal no recent diastrophic events occurring in the panhandle. In fact, this area is considered to be one of the most stable in the world. Thus, the major agent responsible for shaping this area is the sea level fluctuations (Brooks). When the sea stood at lower levels, rivers flowed across the exposed land, scouring valleys, estuaries, and bays. With subsequent climatic warming, the seas rose and engulfed the excavated features. Barrier islands of Recent age are also common along the coast.

An overview such as a satellite image clearly displays the prominent features associated with the coastal area. Total coverage of the panhandle's coast requires scenes from three separate satellite passes. A satellite image mosaic of Florida, which includes three such passes, has been widely distributed by the United States Geological Survey (USGS). A list of addresses for obtaining available images and information can be found at the end of this report.

The seven areas of study lie in the physiographic province known as the Coastal Plain Province. A physiographic map appears as Figure 22 and depicts three divisions of this province: the Embayed Alluvial Coast, the Apalachicola Foreland, and the Big Bend Drowned Karst division. These divisions are based on the different physical features and types of material present along the coast.

The Embayed Alluvial Coast

The Embayed Alluvial Coast extends from the Gulf/Bay county line westward. Underlying this area is a thick sequence of Tertiary sediments that slope seaward, creating a simple homocline. The sediments consist of sand, silt, and clay. Minor amounts of limestone are present.

The estuaries decrease in size from Mobile, Alabama to Panama City, Florida. These embayments are examples of flooded waterways that were eroded during lower stands of the sea. The energy conditions that result from wave action and currents along this coastal section are moderate.

The Apalachicola Foreland

The division called the Apalachicola Foreland has been adopted for this report due to the prominent foreland associated with the Apalachicola River and drainage system. This division stretches from the Bay/Gulf county line to east of the Ochlockonee River. This feature is plainly visible on satellite imagery and area maps.

The cusped foreland is a relic of an ancient river delta that prograded as a beach ridge plain (Schnable, Schnable and Goodell). The Apalachicola River has not contributed to the construction of the foreland in Recent geologic time. Today, much of the alluvium is being trapped behind dams constructed upstream. Sediment that is being transported is deposited as a bayhead delta under estuarine conditions. Barrier islands have developed shoreward of this ancient delta and have been determined to be less than 6000 years old.

The western portion of this division is characterized by a natural bar and spit development, known as St. Joseph Spit. This barrier acts as protection to the natural lagoon, St. Joseph Sound.

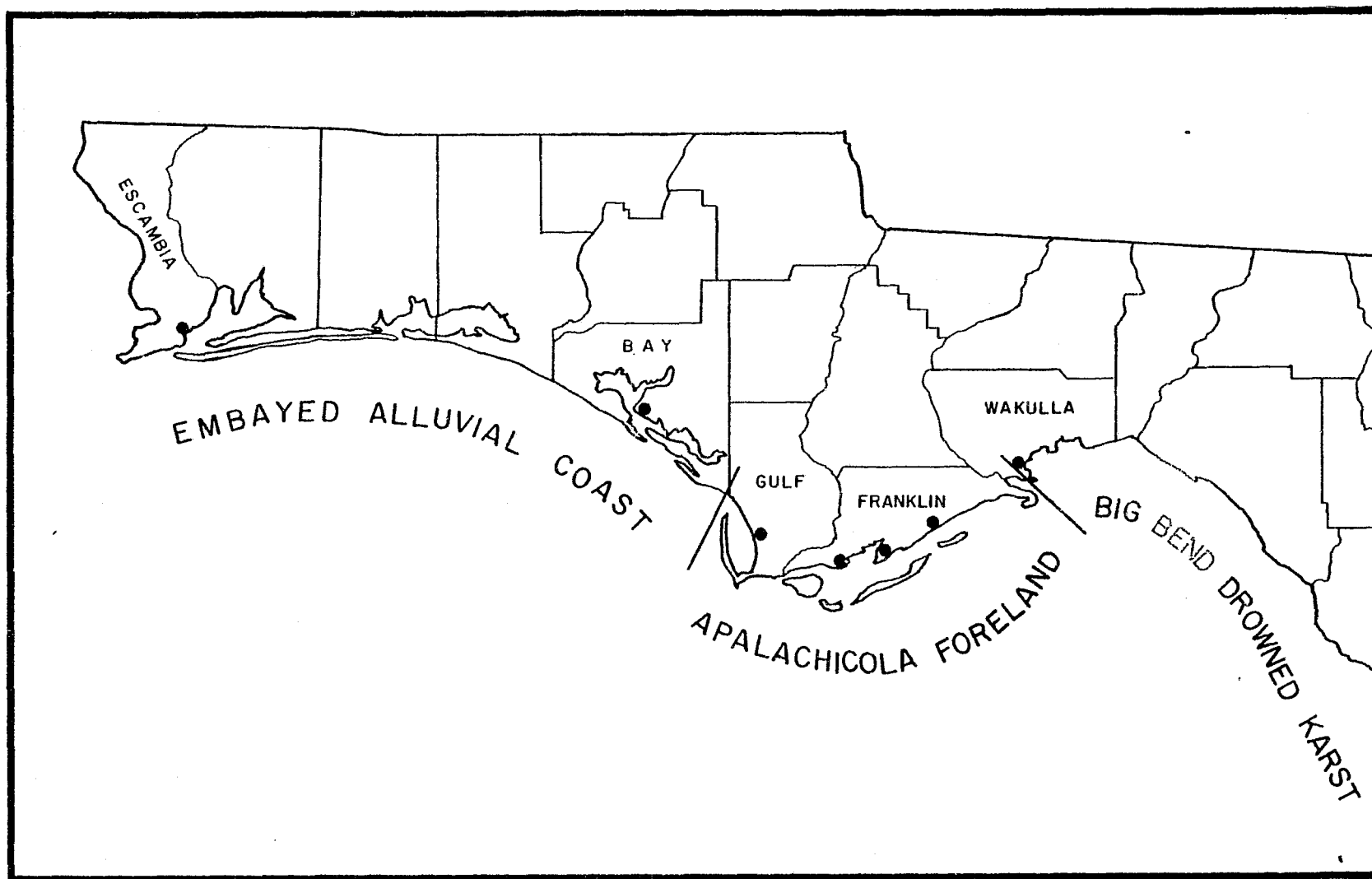


Figure 22.--Physiographic divisions of the Coastal Plain Province for the panhandle of Florida.

The Big Bend Drowned Karst

The Big Bend Drowned Karst division of the Coastal Plain Province is characteristic of the coastline that extends from the Ochlockonee River to north of Pinellas County. The concern of this study only includes that portion of the coast beginning with the boundary of the Apalachicola Foreland and culminating east of Panacea. A gently sloping limestone plain extends from the Florida peninsula to Panacea with rock occurring both onshore and offshore. Rock is still encountered at shallow depths as far as Carrabelle. Carrabelle is considered to be in a transition zone between the rocky coast to the east and the alluvial coast to the west. Alluvium is introduced to the area by the Apalachicola and Ochlockonee rivers. The sediment load carried by rivers to the east is substantially lower and consists largely of organic matter.

Energy conditions for the Big Bend Drowned Karst physiographic division are considered low. This low energy condition is a primary reason for the development of oyster bars.

Tides

The moderate and low energy levels present along the coast of the panhandle are in part due to the small tidal range. Tides in the study area have a range of two to two and one half feet. From Panama City westward there is a diurnal fluctuation, whereas the remaining west coast of Florida has a mixed tide. The small range, combined with the reduced tidal frequency, minimizes the influence of tides and tidal currents. Table 52 presents the tidal information for most of the study area.

The Nature of the Fishing Grounds

In contrast to the north Atlantic, where the vast and rich offshore areas are harvested, the south Atlantic and north Florida fishing is concentrated in local bays, estuaries, lagoons, and the offshore areas where scattered reefs and rock outcrops are located. Such localized fishing can be attributed to several factors.

Table 52.--Tidal information for seven port areas in north Florida.

Location	Mean high water	Mean tide level	Mean low water ^a	Extreme low water
-----Feet-----				
Pensacola	1.3	0.6	0.0	-2.0
Panama City	1.3	0.6	0.0	-2.0
Port St. Joe	1.4	0.7	0.0	-2.0
Apalachicola/ Eastpoint	1.7	0.9	0.0	-2.0
Carrabelle	2.6	1.3	0.0	-2.0
Ochlockonee (Panacea)	2.5	1.5	0.0	-3.0

^aHeight referred to datum Mean Low Water (MLW).

Source: NOAA/NOS nautical charts of the Gulf coast.

Primarily, the location of the fishing grounds are in response to the geographic, geologic, and hydrographic conditions. The various physiographic features of the Coastal Plain Province were previously mentioned. For further discussion of the geology and hydrography of the panhandle see: "A Summary of Knowledge of the Eastern Gulf of Mexico", Institute of Oceanography, S.U.S., St. Petersburg, 1973.

The fishing grounds located in protected waters are affected by the volume of water, chemicals, and mineral matter discharged from the rivers, as well as bottom conditions and sediment type. In the northeastern Gulf, the warm tropical waters of the Loop Current impinge upon the Florida panhandle coast from Panama City westward. This, in conjunction with irregular bottom conditions, outcrops, and reef structures are factors controlling the fishing activities in this area. Figure 23 illustrates the location of the offshore fishing grounds. A brief description which includes the common name, depth, and the physical nature of the bottom follows the illustration as Table 53.

Another factor that contributes to localized fishing is that the state of Florida leases specific plots to the fishermen. Such is the case with the restricted oyster fishing present in the Apalachicola area.

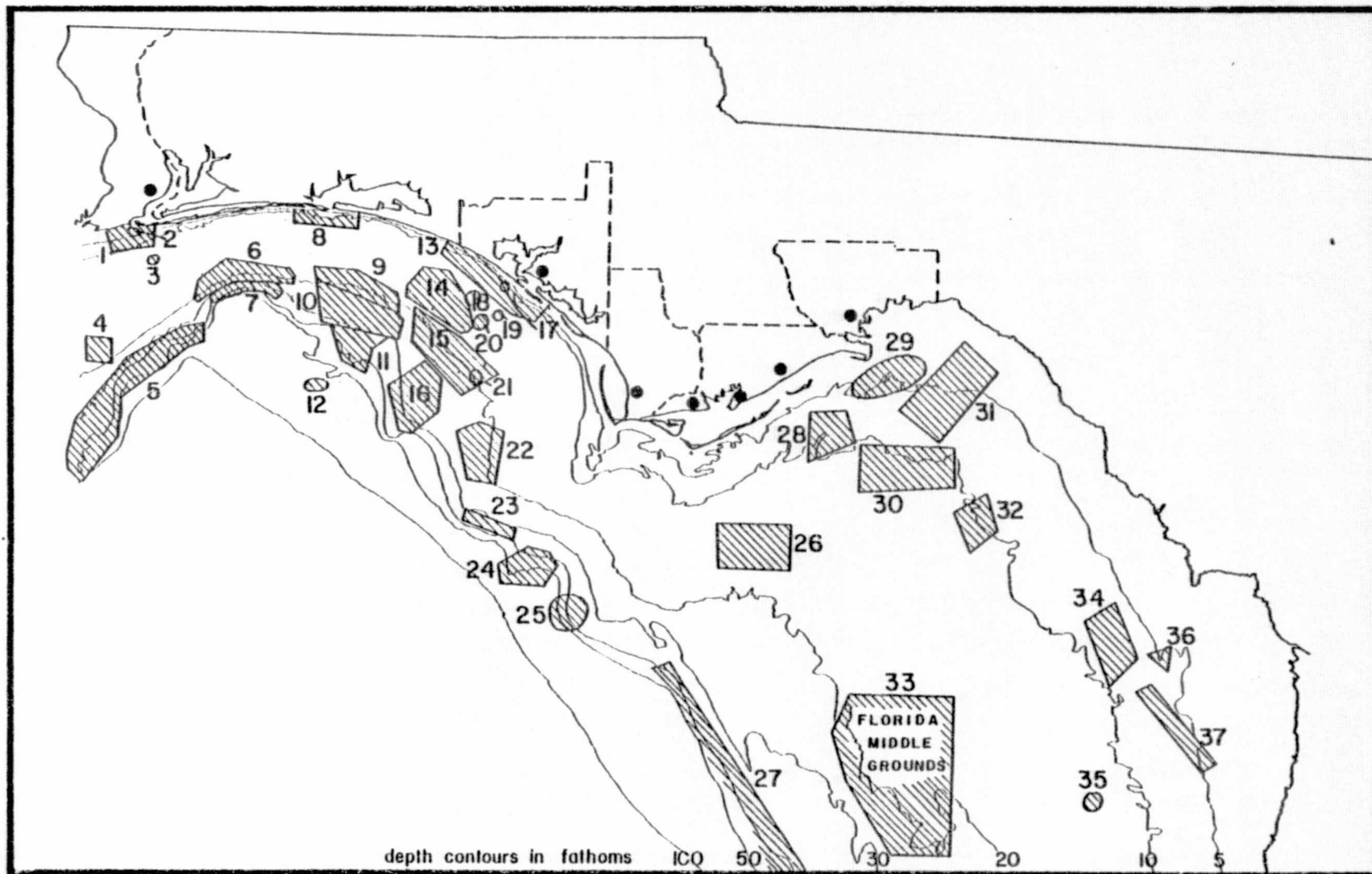


Figure 23.--Location of offshore fishing grounds in the northeastern Gulf of Mexico.
Source: A Survey of Offshore Fishing in Florida.

Table 53.--Description of offshore fishing grounds in the northeastern Gulf of Mexico .

Area	Local Name	Location	Depth	Bottom Composition, Topography
1	The Sea Buoy	30° 14' to 30° 17' N. 87° 14' to 87° 23' W.	3 to 10 Fathoms	Rolling sand bottom with rare occurrences of low rock; occasional patches of shell, gravel or grass. One small privately constructed artificial reef.
2	The Massachusetts	30° 16' N. 87° 19' W.	Exposed	Sand bottom; wreck of old battleship.
3	The Wreck	30° 12' N. 87° 13' W.	13 to 14 Fathoms	Metal wreck of an old Russian freighter; located on a hard sand bottom.
4	Trisler Grounds	30° 51' to 30° 56' N. 87° 22' to 87° 29' W.	17 to 20 Fathoms	Three rock formations on a hard sand bottom; few rocky patches between the larger widespread rock formations; shell and invertebrate growth occur on and near the rock formations.
5	50 Fathom Edge, the Edges	29° 26' to 30° 00' N. 87° 00' to 87° 30' W.	30 to 80 Fathoms	Sand and shell bottom with rock ledges. The rock ledges are steep and rugged and run parallel to the contour lines; large expanses of rolling sand bottom; 30 to 50 fathoms is the most fished area.
6	The Timber Holes	30° 05' to 30° 12' N. 86° 40' to 87° 05' W.	15 to 21 Fathoms	This area stretches just inshore of the 20 fathom contour. The bottom is mostly sand and occasionally sand and shell; numerous holes, dips and gullies of one to several fathoms are present. Rock formations are in the deeper portions of these depressions; coral and other invertebrate growth on the rock.
7	29 Edge 27 Edge	30° 04' to 30° 07' N. 86° 44' to 87° 00' W.	24 to 30 Fathoms	Northernmost section of the DeSoto Canyon. Very steep slope with high rugged rock cliffs. Area of 27 to 31 fathoms most fished. Slopes from 30 to 50 fathoms in 2 miles; coral and other invertebrate growth on the exposed rock; large deposits of sand and shell.
8	The Sea Buoy	30° 19' to 30° 23' N. 86° 24' to 86° 33' W.	4 to 13 Fathoms	Sloping flat sand bottom. Very few rock areas; some wreckage present; obstructions are the best producing areas.
9	Southeast Grounds	30° 04' to 30° 11' N. 86° 14' to 86° 34' W.	15 to 21 Fathoms	Rolling sand bottom with occasional areas of shell and gravel. Low rock formations occur occasionally at the foot of the sand hills; sponge and coral growth on the hard bottom and rock areas.

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Table 53.--Continued.

Area	Local Name	Location	Depth	Bottom Composition, Topography
10	27 Fathom Area Southeast Grounds	29° 57' to 30° 04' N. 86° 12' to 86° 33' W.	22 to 32 Fathoms	Irregular sand bottom. Holes and gullies 6 feet to 12 feet deep with rock formations in the bottom of these depressions. The wrecks of a few airplanes are scattered through the northwestern section of this area.
11		29° 51' to 29° 57' N. 86° 13' to 86° 30' W.	33 to 41 Fathoms	Irregular sand and shell bottom. Numerous rock formations, some occurring in depressions and others as small cliffs. The sand ridges and rock ledges are generally parallel to the coast line. Heavy invertebrate growth on most of the exposed rock ridges.
12	Mingo Ridge	29° 17' N. 86° 33' W.	61 to 33 Fathoms	A steep rock ridge; the ridge rises abruptly from 190 feet to 180 feet and then drops off sharply 200 feet to a sand and mud bottom. The rock formations are rugged and heavy with invertebrate growth.
13	Trolling Grounds	30° 02' to 30° 16' N. 85° 39' to 86° 04' W.	3 to 12 Fathoms	Sand bottom with rare occurrences of shell and rock. One artificial reef in the area. Buoys and one high rock formation are the most frequently fished areas.
14		29° 58' to 30° 11' N. 85° 56' to 86° 11' W.	13 to 18 Fathoms	Irregular sand bottom, occasional holes with rock in the deepest sections of the depressions; scattered grass in the shallower areas. Colonial tunicates are found on the rocks.
15	3 to 5's	29° 46' to 30° 04' N. 85° 50' to 86° 12' W.	17 to 23 Fathoms	Irregular sand bottom. Many sharp dips and ledges of 3 to 5 fathoms in relief; coral and other invertebrate growth on the rock areas. The ledges are parallel to the 20 fathom contour.
16		29° 39' to 29° 52' N. 86° 04' to 86° 13' W.	23 to 45 Fathoms	Sand bottom; irregular relief of 3 to 4 fathoms; ridges of rocks run parallel to the coast; extensive soft and hard coral growth. Three airplane wrecks present in the shallow portion of this area. Rock cliffs are rugged with protrusions and caves.
17	The Rock Pile	30° 07' N. 85° 49' W.	70 to 80 Feet	Rock formation on an expansive sand bottom; relief of one fathom.

Table 53.--Continued.

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Area	Local Name	Location	Depth	Bottom Composition, Topography
18	Tarpon Wreck	30° 06' N. 85° 56' W.	16 Fathoms	Sand bottom; wreck of a freighter sunk in 1932.
19	Warsaw Hole	30° 02' N. 85° 50' W.	80 to 85 Feet	Abrupt break in hard sand bottom; depressions 2 to 3 fathoms deep with steep rocky sides; cave present, supplemented by automobile bodies and other junk. Heavy invertebrate growth.
20	Offshore Platform	30° 01' N. 85° 54' W.	15 Fathoms	Sand bottom with a Navy maintained oceanographic station built on a permanent platform. Wreck of a barge just northwest of the platform; few low rock formations in the vicinity.
21	The "Leroy"	29° 50' N. 85° 55' W.	19 Fathoms	Sloping sand bottom with the wreck of the tugboat "Leroy", sunk about 1932—only the boiler remains; due south of the Oceanographic Platform; sand and sparse shell surrounding the wreck.
22	3 to 5's	29° 27' to 29° 41' N. 85° 49' to 85° 59' W.	17 to 25 Fathoms	Sand bottom, occasional areas of shell and mud, usually associated with rock ledges. The rock ledges have a relief of 3 to 4 and sometimes 5 fathoms; the rock ridges are heavily covered with coral and other invertebrates. There are a few wrecks in this area that produce well when located.
23	The Mud Banks	29° 19' to 29° 22' N. 85° 45' to 85° 55' W.	31 to 34 Fathoms	Rock ledge; sharp rise of one fathom followed by a steep drop of 3 to 4 fathoms. The rock face of the cliff is very rugged, covered with invertebrate growth. Ledge extends 7 to 8 miles.
24	Whoopie Grounds	29° 09' to 29° 15' N. 85° 35' to 85° 45' W.	36 to 60 Fathoms	Sand bottom with rock ledges of 3 to 4 fathoms relief. The rock ledges have steep rugged slopes; few areas of rock with 5 fathom relief; covered with coral and other invertebrate growth.
25	The Elbow	28° 58' to 29° 04' N. 85° 27' to 85° 33' W.	50 Fathoms	Extends along the 50 fathom contour partially illustrated on Map VII; rock ledge of 4 fathoms dropping into sand and mud bottom.
26		29° 11' to 29° 20' N. 84° 39' to 84° 56' W.	12 to 19 Fathoms	Flat limestone bottom with ridges, holes, and crevices of 2 to 15 feet; expanses of sand, gravel and mud are common.

Table 53.--Continued.

Area	Local Name	Location	Depth	Bottom Composition, Topography
27	The 40 Fathom Edge The Edges	26° 40' to 23° 50' N.; Longitude varies with the 40 fathom contour line	36 to 45 Fathoms	Extensive linear area along the 40 fathom contour line; ridges of limestone rock extending parallel to the coast line through flat areas of sand and shell.
28		29° 33' to 29° 48' N. 84° 24' to 84° 35' W.	6 to 11 Fathoms	Uneven, slightly rolling sand bottom with ridges of limestone rock and shell lying parallel or at a slight angle to the coastline; few ledges of rock 6 to 8 feet high scattered through the area.
29		29° 46' to 29° 54' N. 84° 07' to 84° 25' W.	1.5 to 7 Fathoms	In vicinity of sea buoy; inshore area with expanses of sand, grass flats, and shell and rock; gentle rolling relief; extensive sand ridge runs through the area ridge marked on map.
30		29° 27' to 29° 36' N. 84° 00' to 86° 23' W.	9 to 12 Fathoms	Hard sand bottom with scattered holes and gullies; broken rock on the edges and bottoms of the depressions; gentle slope toward deeper water.
31		29° 37' to 29° 57' N. 83° 50' to 84° 14' W.	2 to 7 Fathoms	Hard sand bottom with a series of gullies running N.E. and S.W. in direction with shell and broken rock in the depressions.
32		29° 14' to 29° 26' N. 83° 50' to 84° 00' W.	10 to 11 Fathoms	Flat sand and shell bottom with scattered outcroppings of limestone rock; gentle slope toward deep water with mild relief.
33	Florida Middle Grounds	28° 11' to 28° 45' N. 84° 00' to 84° 25' W.	13 to 25 Fathoms	Extensive, irregular area with relief up to 7 fathoms common; sand, shell and broken rock in depressions and gullies; edges of hills most productive; heavy invertebrate and vegetative cover.
34		28° 47' to 29° 04' N. 83° 16' to 83° 29' W.	30 to 54 Feet	Flat bottom; north end has rock outcroppings in depressions on a sand and shell bottom; south end has low rock ridges extending along a sand and shell bottom.
35		28° 23' N. 83° 22' W.	65 to 70 Feet	Area of 2 square miles; high relief; 14 foot ledges and rock formations; sand and shell surrounding rock.
36	Yulle Rock	28° 53' N. 83° 10' W.	20 to 30 Feet	Relief up to 10 feet; rock ledges and rounded rock coming up through a flat sand bottom.
37		28° 28' to 28° 48' N. 82° 57' to 83° 17' W.	23 to 42 Feet	North end—flat gravel and sand bottom with sink holes and rock outcroppings; south end—flat bottom of sand, gravel, and grass with a few ridges and rock outcroppings.

Source: A Survey of Offshore Fishing in Florida.ORIGINAL PAGE IS
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Existing Port and Potential Site Evaluations

The following discussions evaluate each of the seven ports with respect to local physiographic and hydrographic conditions. Potential sites are reviewed with respect to the indicated needs, as determined by the FAMRC study. Both advantages and disadvantages are presented, along with recommendations. The reader is again referred to the general location map, Figure 21, the physiographic map, Figure 22, and Figure 23, a map depicting the offshore fishing grounds.

A black and white rendition of a 1972, 1973, or 1975 Mark Hurd color infrared photograph covering each study area has been included as an aid to the reader in establishing spatial relationships, as well as providing an overview of the area.

In order to help identify and clarify the features in the photos, two maps covering the photographs have been provided. The pertinent information has been divided between the two. The first map provides the names of geographic points of interest, location of potential sites, and bathymetric data. The second map depicts a cursory pattern of roads and rail facilities, identifies local water bodies, and channel positions. The original scale of the aerial photographs was 1:80,000. The black and white reproductions and maps provided in this report approximate this scale.

Pensacola, Escambia County

On the western boundary of the Embayed Alluvial Coast lies Pensacola, the westernmost port under consideration. This deep water port is located in Escambia County and lies nearly 100 miles west of Panama City. The port of Pensacola is located in Pensacola Bay which is a drowned estuary and lagoon protected from the open Gulf by the barrier island, Santa Rosa Island. Pensacola Bay divides northward into two branches, Escambia Bay and a branch composed of East and Blackwater bays. These bay branches are estuaries for the Escambia River, and the Yellow and Blackwater rivers, respectively. These rivers contribute the majority of fresh water and sediment to the bay system, although the amount of sediment introduced is not significant.

The bay bottom is flat with an average depth of 19 feet, except for the dredged channels and spoil banks. Maintenance of the channel does not appear to be a problem. This is probably due to the lack of sediment supplied to the navigational channels and the scouring ability of the tidal currents caused by the tidal prism. The two maps covering the same area of Pensacola, as the reproduced aerial photograph, appear as Figures 24 and 25. The aerial reproduction appears as Figure 26.

The physical setting of the harbor facilities is excellent. As seen on the above mentioned figures, the port facilities are concentrated along the waterfront in the downtown area. Rail terminals, fuel storage, a marina, large berths, shipping warehouses, and a sewage disposal plant are located along this portion of the waterfront. However, berthing and shore facilities have deteriorated, impairing their utility.

The most logical location for additional dock space is the present downtown location. Upgrading existing facilities should satisfy the present needs of the fishermen. As previously mentioned, many supporting facilities and services are already present and channel maintenance is minimal. No bridges are present to obstruct navigation. A large scale expansion project at this site is not feasible, due to limited space. The city plans to renovate this existing site. If the commercial fishermen want specialized docking and facilities, now is the time for them to make their needs known.

An alternative site for additional dock space lies west of the present facility, in the tidal creek of Bayou Chico. Docks constructed in this commercial and industrial area would have the added protection from storm waves, being in the tidal creek. There is a bascule bridge obstructing the entrance to this creek. Additional dredging may also be required to deepen the channel.

Because of Pensacola's distance from the other fishing ports in this study, the localized fishing, and the habits of the fishermen, this port would not be a good choice for a large facility that would serve the commercial fishermen of the northeastern Gulf. Pensacola can best serve large, ocean going trawlers that fish the Campeche Banks and continental shelf from Texas to Mississippi and the limited number of coastal fishermen that do not venture far from this, their home port.

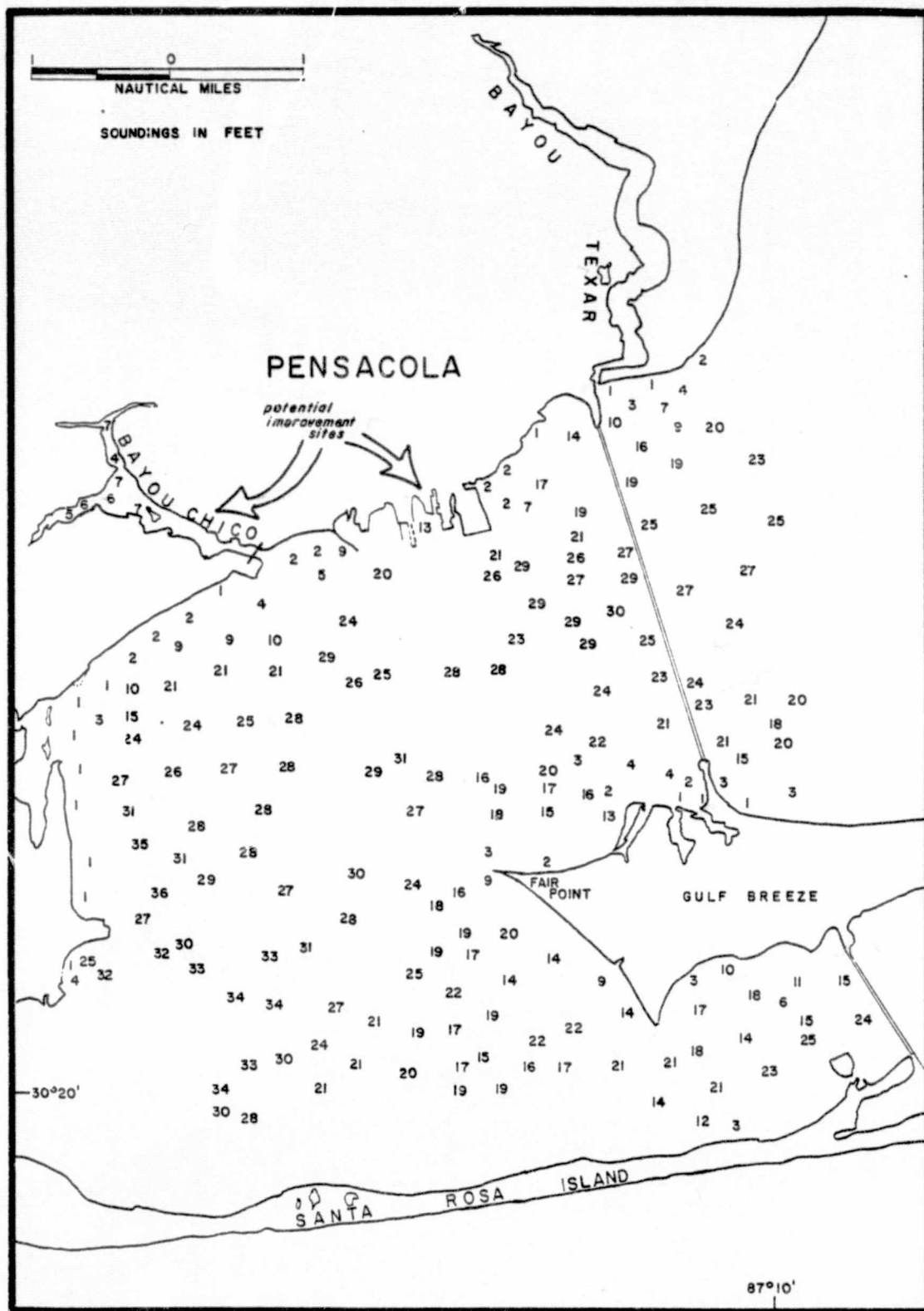


Figure 24.--Bathymetry and potential port improvement sites for the Pensacola area.

Source: NOAA/NOS nautical charts.

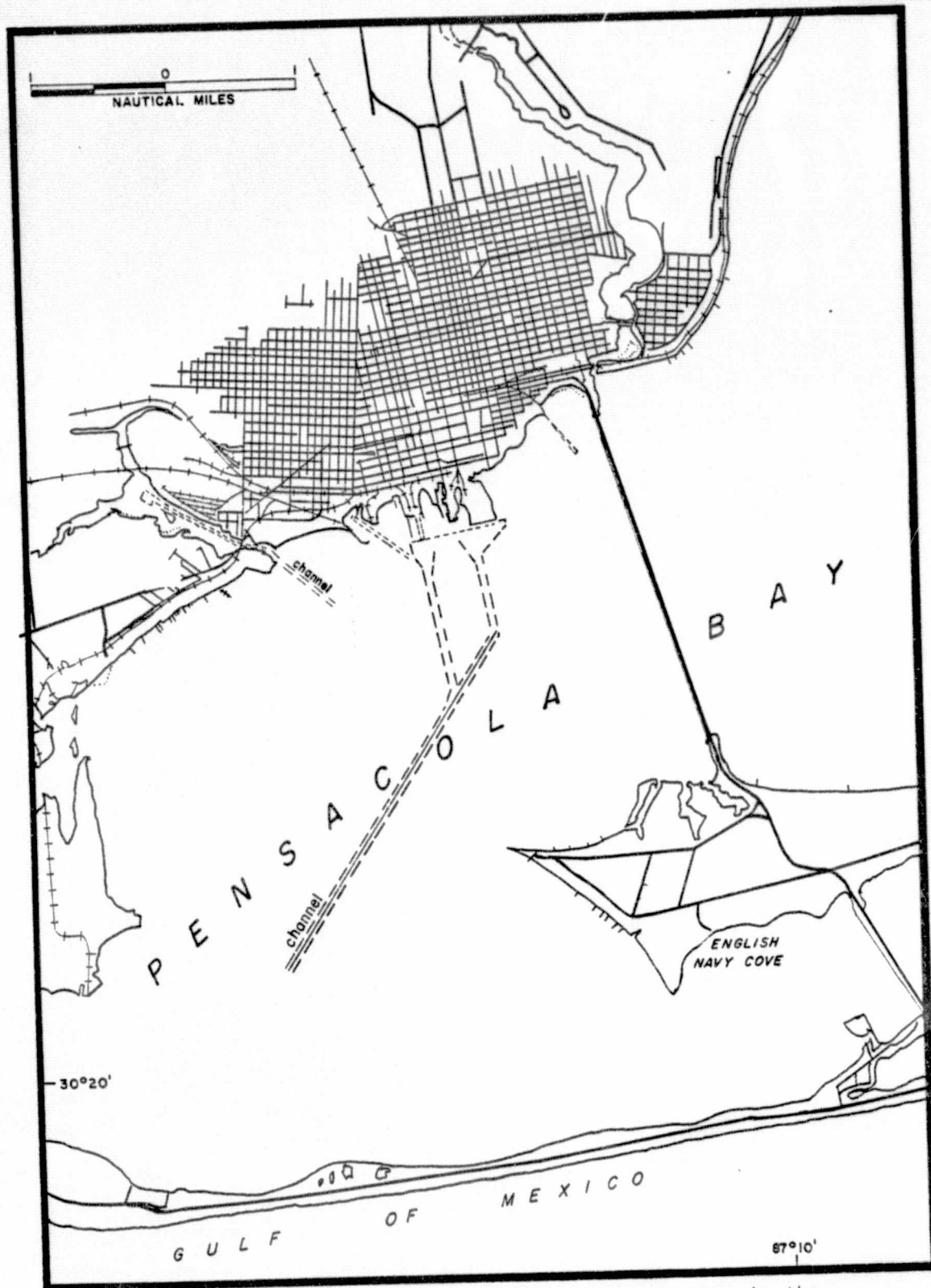


Figure 25.--Channel locations, road and rail facilities in the Pensacola area.

Source: NOAA/NOS nautical charts.

Figure 26.--Aerial view of Pensacola.

Source: Mark Hurd color infrared photography, 1973.



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Panama City, Bay County

Situated near the eastern boundary of the Embayed Alluvial Coast is the port of Panama City. The associated bay system is a drowned river valley consisting of St. Andrew Bay and its tributaries, West Bay, North Bay, and East Bay. Discharge of land runoff into this system is relatively small and siltation is not a serious problem. The bay is relatively unpolluted as compared to Escambia Bay, which has chemical plants along the shoreline.

Direct access to this deep, well protected harbor is provided by a man-made ship channel that cuts through the offshore barrier island. The natural entrance is located at Lands End Peninsula, at the eastern end of Shell Island. Storm protection is afforded by the barriers. Most of these features are clearly visible in Figures 27 and 28 and in the aerial view, Figure 29.

Panama City is situated near more offshore fishing grounds than any of the other ports. The reader is again referred to Figure 23, which illustrates the offshore locations. The warm waters of the Loop Current and the rocky bottom between 30 and 60 fathoms create ideal conditions for grouper and snapper fishing.

Results of the FAMRC study indicate that the fishermen using Panama City as a home port would like additional dock space and a breakwater. Based on study of aerial photography, it is apparent that the waterfront of the city and adjacent lands is a complex of industrial, commercial, military, residential, and recreational areas. Docking facilities are varied and widely scattered. The FAMRC study indicates that although there is a considerable amount of available dock space, much of it is used by sports fishermen and pleasure craft. A centralized landing area would possibly benefit both the community and commercial fishermen.

St. Andrew Marina, near Buena Vista Point, is a municipal docking and service facility that could serve as the nucleus for the centralized landing. This marina cannot be significantly enlarged without the added expense associated with deep water construction. However, if additional facilities were needed, they could be developed just north of the marina along the bayou entrance and waterfront. A breakwater could be incorporated in dredging and construction plans. This area should provide adequate storm protection.

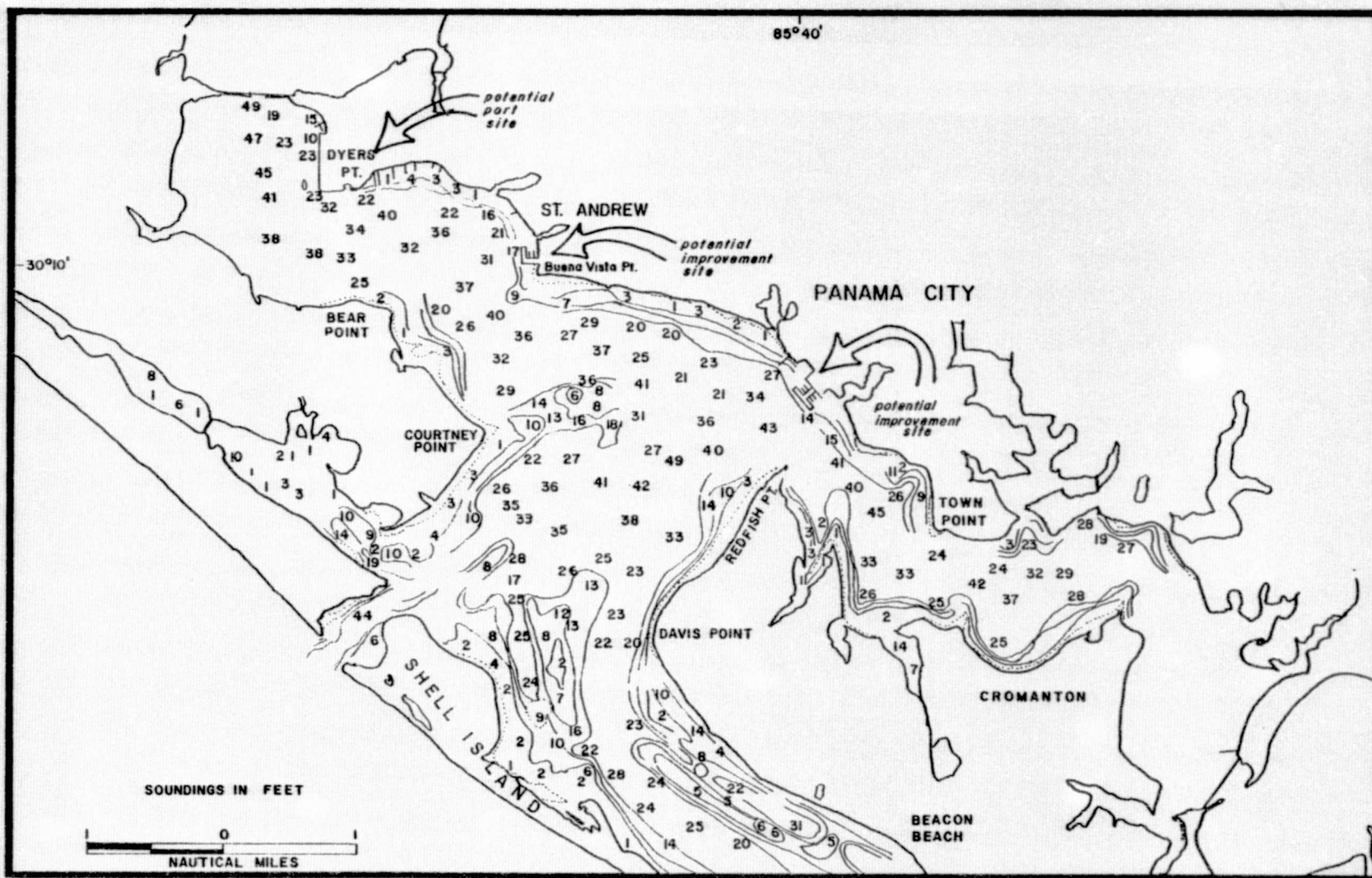


Figure 27.--Bathymetry, potential port and port improvement sites in the Panama City area.

Source: NOAA/NOS nautical charts.

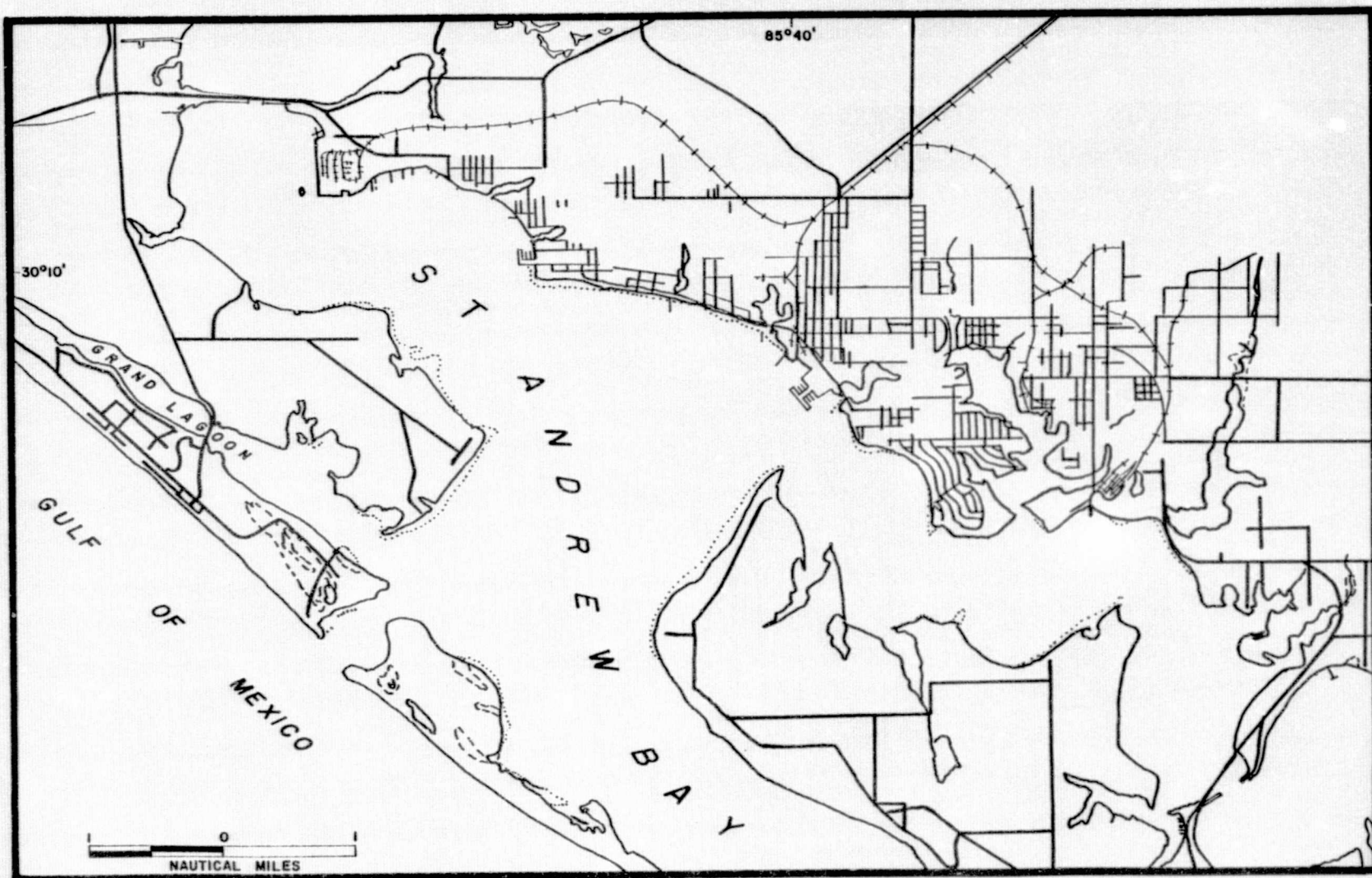


Figure 28.--Road and rail facilities in the Panama City area.

Source: NOAA/NOS nautical charts.

Figure 29.--Aerial view of the Panama City area.

Source: Mark Hurd color infrared photography, 1975.



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Some consideration was given to the large marina near the commercial center of Panama City. Concepts for improvements include the possibility of utilizing the existing facility, in combination with added facilities to be placed on the vacant waterfront property west of the marina, near the Gulf Oil Corporation docks. Space for expansion is limited at this location. Commercial and industrial facilities, including rail and service installations, are presently located downtown. But, because of the odors and need for rapid removal of waste material associated with seafood processing, this location probably should not be considered as a primary alternative.

Dyers Point has been a ship and ship salvage yard for many years and features deep water access, storm protection, and rail service. Its isolated location would probably reduce possible complaints due to the offensive aspects of the fishing industry. If all or any portion of this property were available, it could possibly be developed into a commercial seafood park of the type envisioned by the sponsors of this study.

Port St. Joe, Gulf County

Port St. Joe is situated on the western portion of the Apalachicola Foreland and consists of a series of relic beach ridges that rise ten to 20 feet above sea level. The small community is oriented toward the pulp and paper industry and also serves a number of commercial fishermen.

The port is protected from the open Gulf by a large spit, St. Joseph Spit, that has built both westward and northwestward from the southern tip of the deltaic foreland at Cape San Blas. Active deposition is occurring only near the northern tip of St. Joseph Spit. However, there is a southerly shift of nearshore sediment along the shore. Except near the mainland and spit shores, the main body of St. Joseph Sound is over 30 feet deep. The reader is referred to Figures 30 and 31. This large, deep lagoon or bay endures considerable wave action.

The Gulf County Canal stretches to the northeast across the old Apalachicola River delta, connecting the Intracoastal Waterway with the bay. The sandy dredge spoils have been placed on the canal bank, raising the bank's elevation up to 40 feet above sea level. The spoil is clearly visible in aerial photography, in Figure 32, and satellite imagery. The

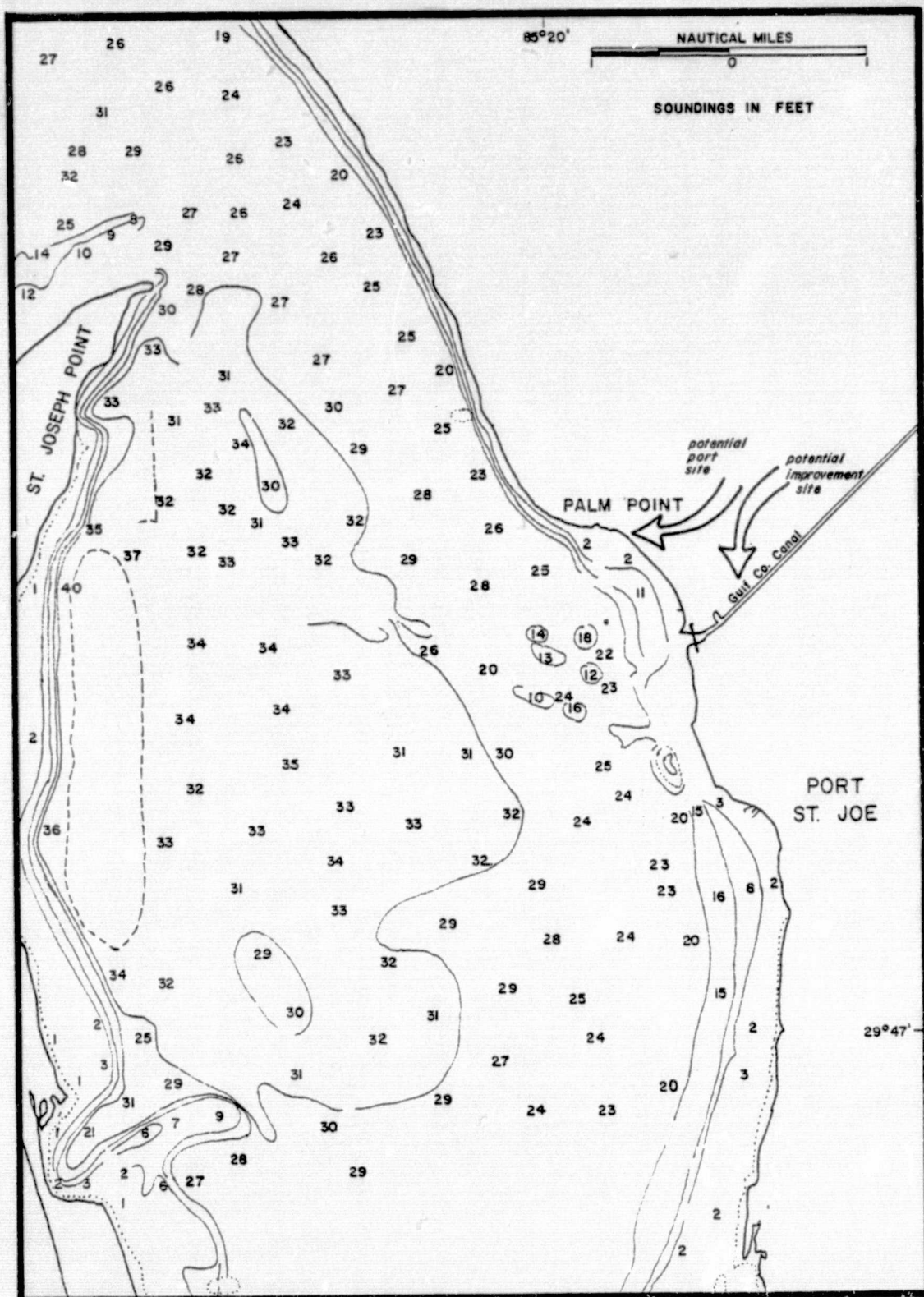


Figure 30.--Bathymetry, potential port and port improvement sites in the Port St. Joe area.

Source: NOAA/NOS nautical charts.

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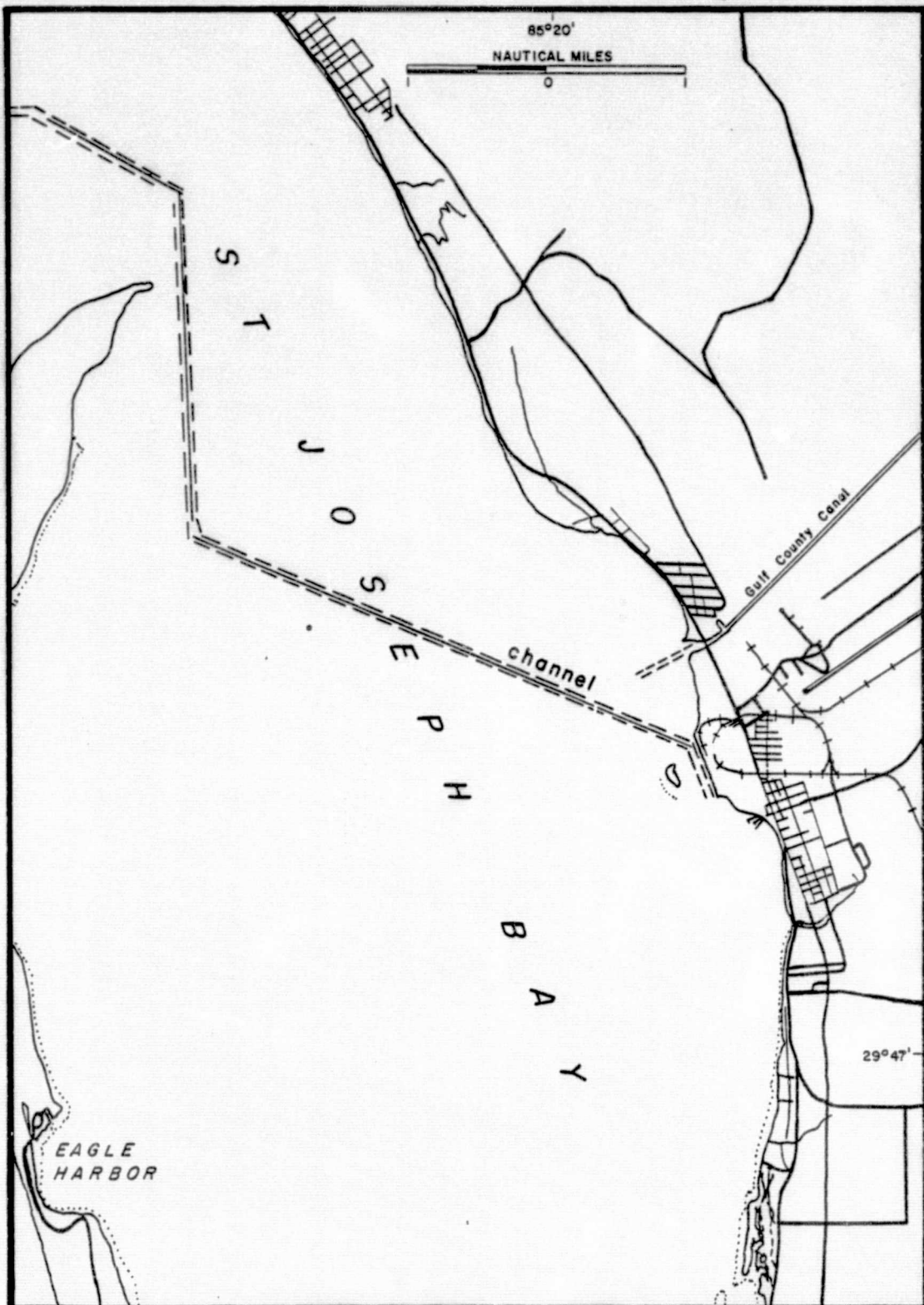
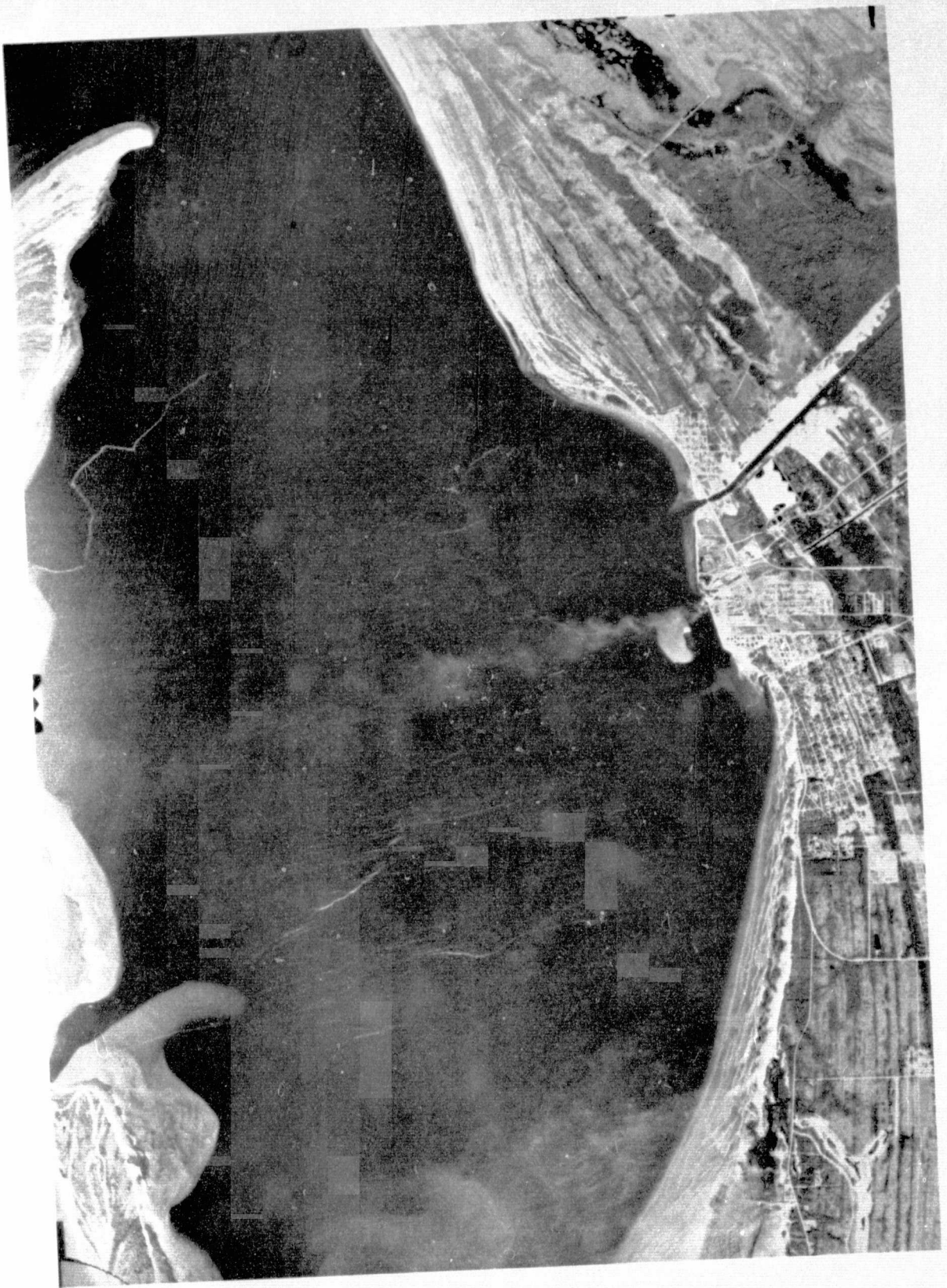


Figure 31.--Channel locations, road and rail facilities in the Port St. Joe area.

Source: NOAA/NOS nautical charts

Figure 32.--Aerial view of the Port St. Joe area.

Source: Mark Hurd color infrared photography, 1975.



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fishermen of Port St. Joe expressed a need for additional dock facilities and channel improvement.

Little development has taken place along the north bank of the canal. Only a small boat basin, docks, and marine facilities are located along the northern bank, close to the bay. This would be a suitable location for some additional dock space. However, this would not be an ideal location for a large marine facility. As mentioned previously, the elevation of the bank has been increased, all of which would have to be removed and placed elsewhere as steps are taken to dredge the major basin. Removal and relocation of the spoil material would increase construction costs dramatically. Present dredging costs usually range between sixty cents and one dollar sixty per cubic yard, depending on the type of material. Rock removal is at an additional expense. In addition, there are no nearby lowlands that could readily accept the spoil. The canal is part of the Intracoastal Waterway system and should be maintained to a depth of 12 feet. This depth should be adequate for the present vessels using the port. A drawbridge which has a clearance of ten feet in the closed position blocks ready access to the bay and Gulf.

If a seafood park were justified, it could most economically be built and maintained along the mainland coast to the south of Palm Point (Figures 30 and 31). The sandy dredge spoil could be used to build up the adjacent land for shore facilities as well as constructing a protective barrier. Since such a structure would interrupt the natural flow of sediment, a bypass system may be necessary. This location would eliminate the problem with the bridge obstruction, however, some storm protection would be sacrificed.

Port St. Joe is a sparsely populated area that offers the space for development of a large seafood park that other locations lack, yet much consideration must be given to the industrial and support facilities needed for such an operation. Few of the necessary facilities are present in this area and there is concern whether the needed facilities would relocate to the area. The expense of relocation must also be considered.

Apalachicola, Franklin County

The maps and aerial photograph included in this report cover both Apalachicola and Eastpoint. The spatial relationship of the two ports and

the southern drainage pattern of the Apalachicola Delta is clearly visible. Hydrographic and cultural features are presented in Figures 33 and 34 and the aerial view appears as Figure 35.

Apalachicola sits at the southern tip of the Apalachicola Delta, occupying the western bank of the river. Apalachicola Bay is the water body connecting the river and the Gulf. Gulf fishermen travel 7.5 miles through the bay and through a cut in the barrier island, St. George Island, in order to reach open water.

The estuary of the Apalachicola River has largely been filled with sediment deposited by the progradation of the bayhead delta. The amount of silt carried by the river system has decreased in recent years due to the construction of dams which trap the sediment upstream.

Although there is a sport marina south of the river mouth, the only available commercial fishing facilities are located along the western river bank, downtown. The identified problems of the Apalachicola area are the lack of dock space and channel depth.

An isolated boat basin with berthing and shore facilities could be developed up Scipio Creek. There is presently an eight foot channel leading to a commercial oyster shell landing. A seafood facility could be located next to, or farther up this tidal creek. The channel would require additional dredging, as would the boat basin. Any location in the river provides protection against marine fouling. It is understood from Mr. John Meyer, City Planner, that a previous study made essentially the same recommendation.

Apalachicola offers several potential sites for a major seafood industrial park serving the northeastern Gulf of Mexico. Turtle Harbor is an area up Scipio Creek that could be developed. The initial land is low and dredging costs would be at a minimum. A dredge and fill operation of the 90 or so acres needed would upgrade this area. With the presence of large amounts of mud, structures would have to be placed on pilings. A channel would have to be extended to the site. A swing bridge with a vertical clearance of only 28 feet is located at the river mouth and may provide a temporary obstacle for the larger vessels.

Another possible location could be the area along the mainland shore, south of the airport. Several dredge spoil dumps and a channel presently

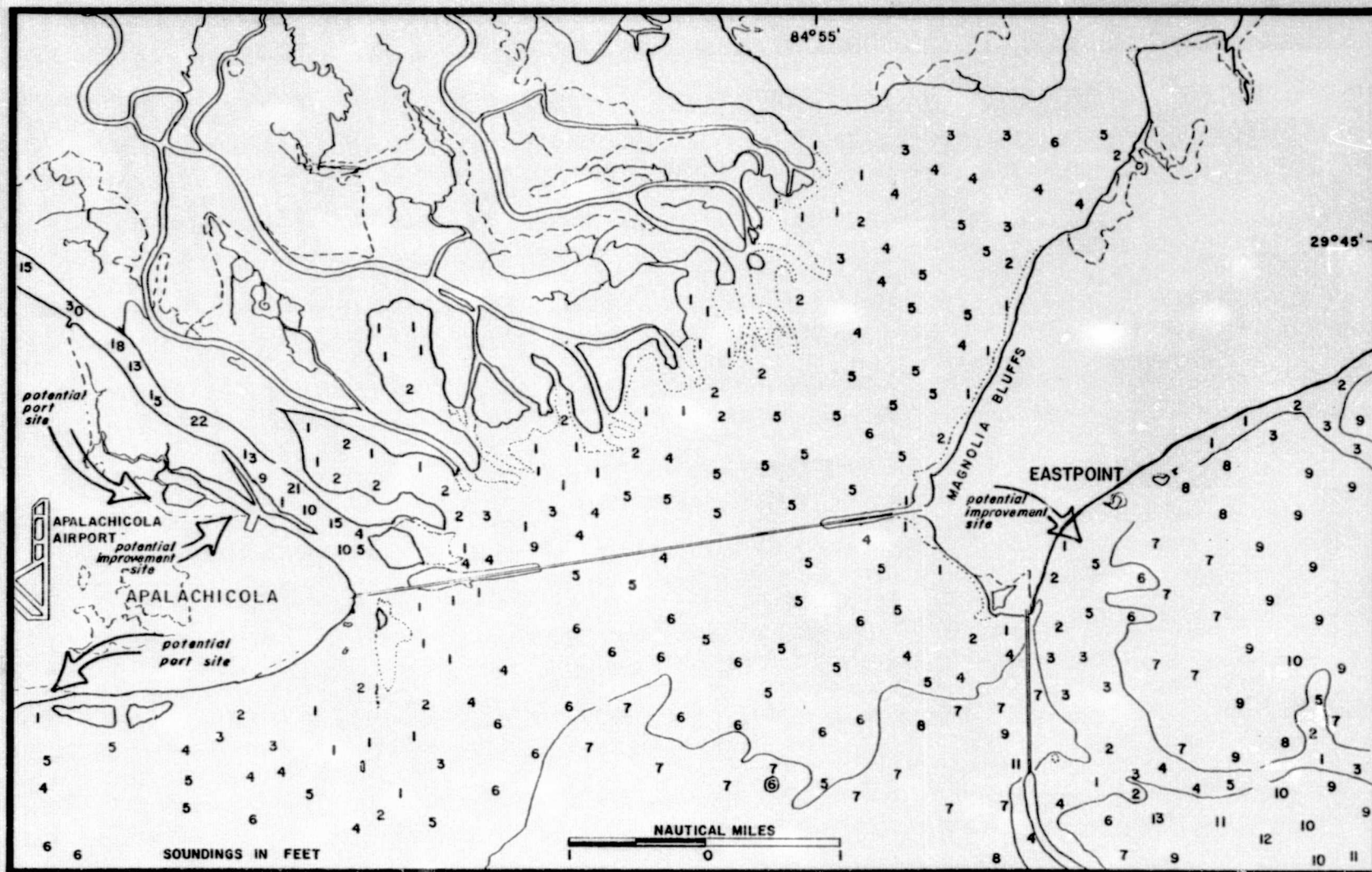


Figure 33.--Bathymetry, potential port and port improvement sites in the Apalachicola and Eastpoint areas.

Source: NOAA/NOS nautical charts.

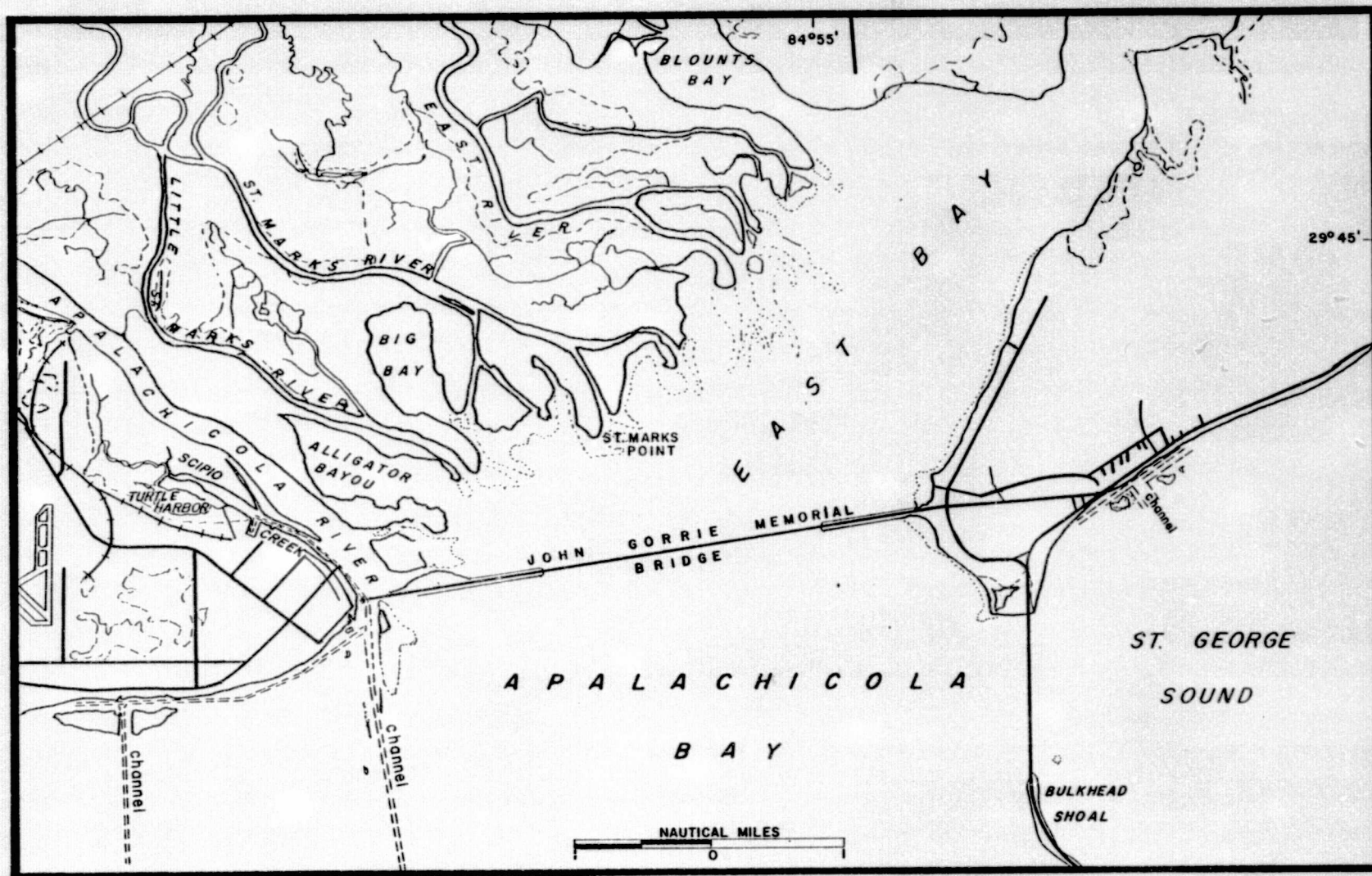


Figure 34.--Channel locations, road and rail facilities in the Apalachicola and Eastpoint areas.
Source: NOAA/NOS nautical charts.

Figure 35.--Aerial view of the Apalachicola and Eastpoint areas.

Source: Mark Hurd color infrared photography, 1973.



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exist. This site would eliminate piling construction necessary in the mud environment up Scipio Creek and the problem with the bridge. Storm protection and antifouling advantages would be less at this location. A suitable navigational channel and breakwater would also be required. Apalachicola does possess a number of marine related industries and support facilities necessary for a seafood park complex.

Eastpoint, Franklin County

Eastpoint is located east of the mouth of the Apalachicola River on a series of ancient beach ridges which form the southern front of the foreland. The small, linear mainland community faces a lagoon protected by St. George Island. This portion of the lagoon is different from the typical portions of St. George Sound to the east, and Apalachicola Bay to the west, in that there is a series of arcuate shoals. It is obvious from the aerial photographs that the shoals are related to the fact that St. George Island is a composite of two former islands separated by a large inlet at the position of East Gap. The extensive shoals and the fluctuating water salinity caused by the fresh water discharge of the nearby river make this an ideal area for oyster production and harvest.

Eastpoint fishermen indicated a need for a breakwater. At the present time, most of the oyster houses are located along a short portion of the bayshore that is partially protected by a discontinuous spoil dump, offshore. This dump is visible on the accompanying maps, Figures 33 and 34 and in the aerial photography, Figure 35. An excellent protected harbor for the small oyster boats could have been developed if the spoil placement had been properly planned. The breakwater should be placed to the west, using interlocking sheet piles.

Eastpoint can best serve only the oyster fishermen who are presently utilizing its limited facilities. A causeway and a fixed bridge with a vertical clearance of 40 feet provide a minor obstacle to access by large vessels approaching from the west. These structures, however, essentially follow Bulkhead Shoals, a natural obstacle. Without the Intracoastal Waterway, boats with drafts of greater than five feet could not pass.

Eastpoint should probably not be considered as a potential site for a seafood park. Although space is available, this site has few marine

industries or support facilities. The presence of the bridge and shoals would further hinder navigation and would require the dredging of a channel.

Carrabelle, Franklin County

Two small tributaries, the New River and the Crooked River, drain the swamps of the eastern portion of the Apalachicola Foreland and merge to form the Carrabelle River. Pertinent features and information are presented on Figures 36 and 37. The features are visible on the aerial photo, Figure 38. This river serves as the community's harbor. The town is located on the eastern bank of the river which is a paleodune field. Land rises ten feet or more above sea level, and at some locations, the elevation reaches 40 feet.

The existing dock facilities are located on the east and northeast side of the river. This location is on the outside of a meander where the strongest currents in the river channel exist. Past erosion associated with the development of the estuary is probably responsible for the local removal of shallow rock that existed in the harbor area.

The Carrabelle River empties into St. George Sound where the navigational channel is maintained to 15 feet. The channel continues around the eastern end of the barrier island, known as Dog Island, and connects with the open Gulf.

Use of the Carrabelle River channel as a harbor has several advantages. This location combines the added protection of the river channel with the protection that the barrier island chain offers against storms. During severe storms, the lower portions of the New and Crooked rivers are navigable and provide further safe refuge. Also, the fresh river water helps eliminate fouling.

The fishermen of Carrabelle indicated a need for increased dock space. The logical place to develop a landing is on Timber Island. This area is largely undeveloped. Here, a spoil dump ten to 20 feet high has upgraded a previously existing saltwater marsh. An access road and utilities already exist on the island.

A moderate sized basin could be economically dredged just to the west of the spoil. Carrabelle is in the transition zone between the Embayed

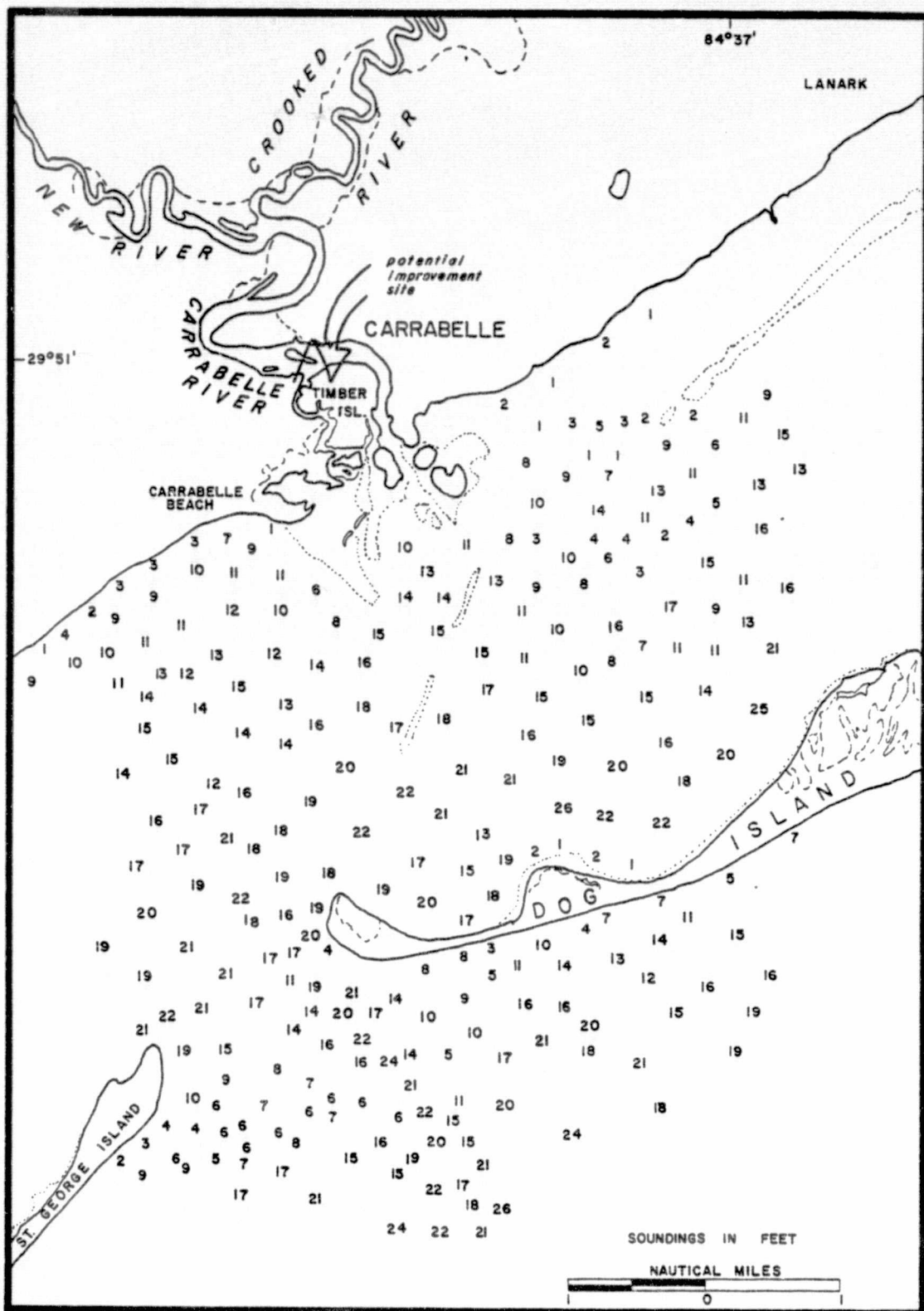


Figure 36.--Bathymetry and potential port improvement site in the Carrabelle area.

Source: NOAA/NOS nautical charts.

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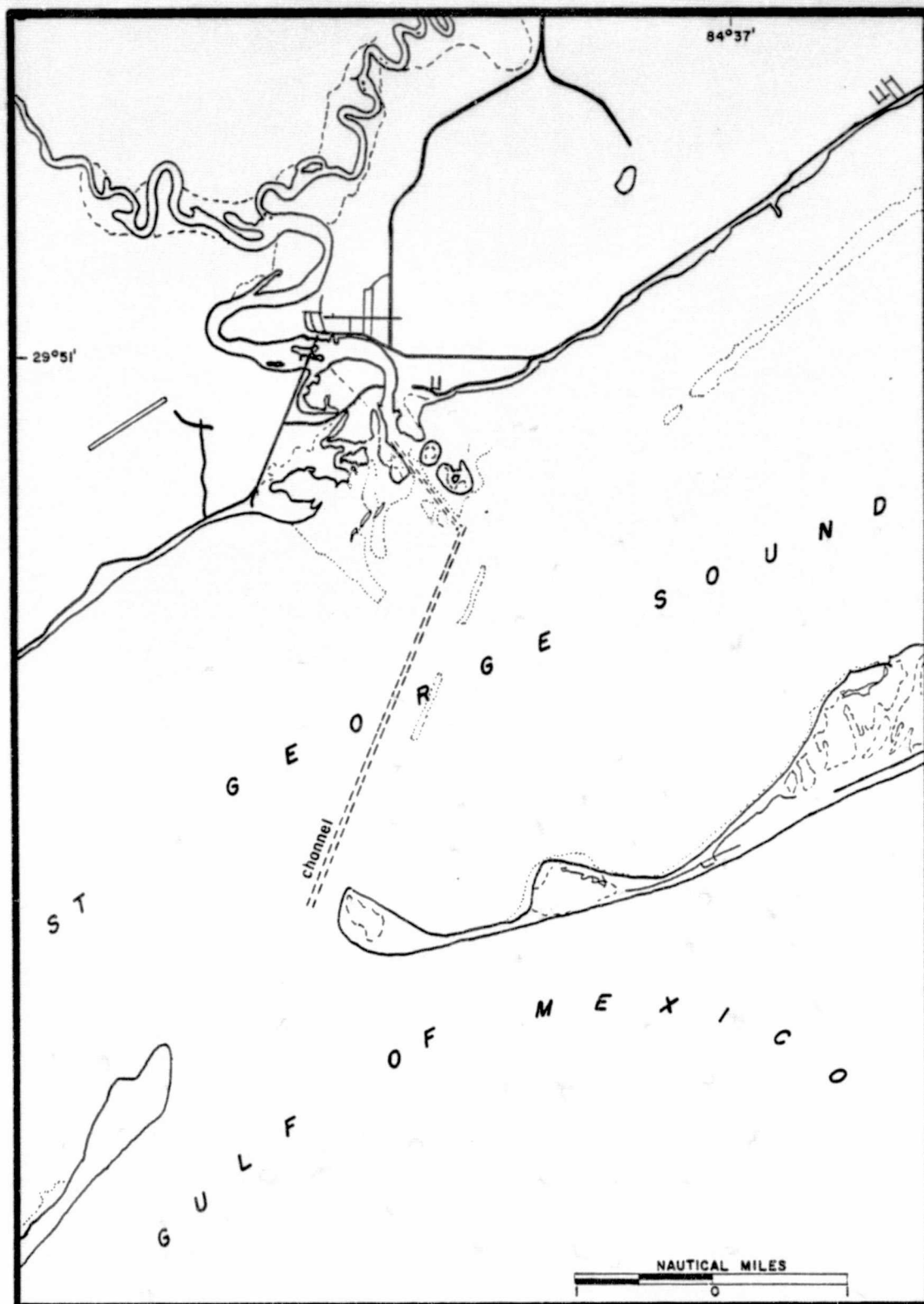


Figure 37.--Channel location and roads in the Carrabelle area.

Source: NOAA/NOS nautical charts.

Figure 38.--Aerial view of Carrabelle.

Source: Mark Hurd color infrared photography, 1973.



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Alluvial Coast to the west and the Big Bend Drowned Karst division to the east. Although rock has been eroded from the channel, other limestone may be encountered during dredging and construction operations. From the imagery, it appears that much of the sediment that has backfilled into this drowned estuary has been carried by tidal currents from the lagoon, not storm floods from the land. Thus, little maintenance would be required if the new basin and channel interconnection were established in this location. Serious consideration should not be given to any locations farther upstream, due to the presence of a fixed bridge just west of Timber Island. This bridge has a vertical clearance of 40 feet and would limit the vessels using the facilities.

Panacea, Wakulla County

Panacea is a small coastal village at the western portion of the drowned limestone plain. As seen from the complementing maps, Figures 39 and 40, and the aerial photo, Figure 41, land gives way to the sea via a wide, complex belt of tidal marshes, flats, shoals, oyster bars, and channels. The water nearshore is extremely shallow and wave action is minimal. No beaches or barrier islands exist. Eastward, most of the arcuate re-entrant coast, known as the Apalachee Bay, is smoother. This is probably due to less surficial sand.

Although the complex belt of marine lowlands provides adequate protection to the harbor during normal storm surges, a hurricane surge would be disastrous. The lowlands of this area extend inland approximately a mile and a half before high ground is encountered. This, in combination with the configuration of the shoreline and the shallowness of Apalachee Bay, affords little protection against larger storms.

The fishermen using the facilities at Panacea indicated a need for additional dock space and improved channel conditions. The most logical sites for additional docking would be on Hungry Point or Porter Island. Both areas have been upgraded by the placement of dredge spoil and both have road access and utilities nearby. Hungry Point would require the least amount of dredging to develop a basin for the landing facilities. An interconnection with the existing navigational channel would also have to be dredged. Minor expansion of existing facilities should also be considered.

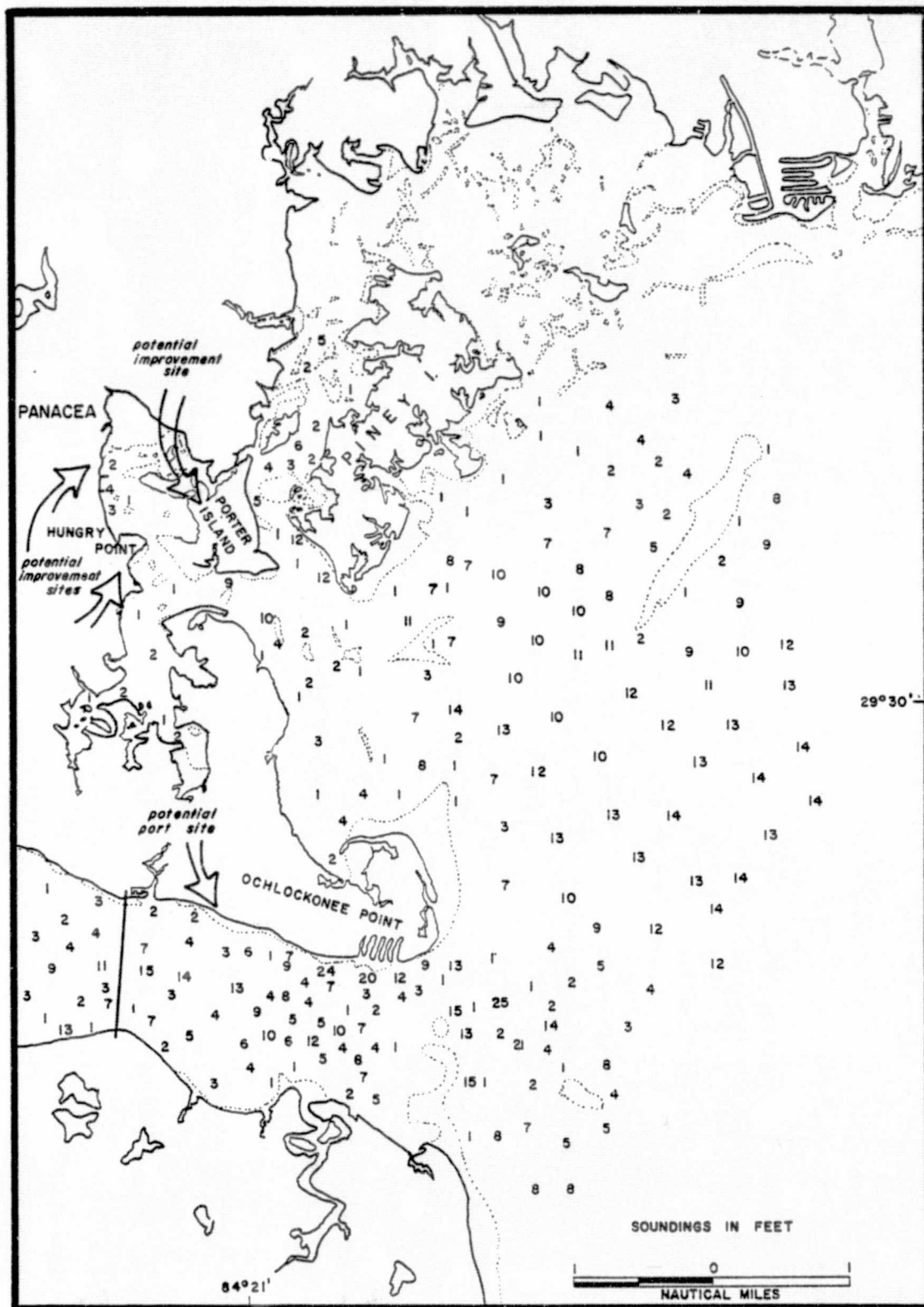


Figure 39.--Bathymetry, potential port and port improvement sites in the Panacea area.

Source: NOAA/NOS nautical charts.

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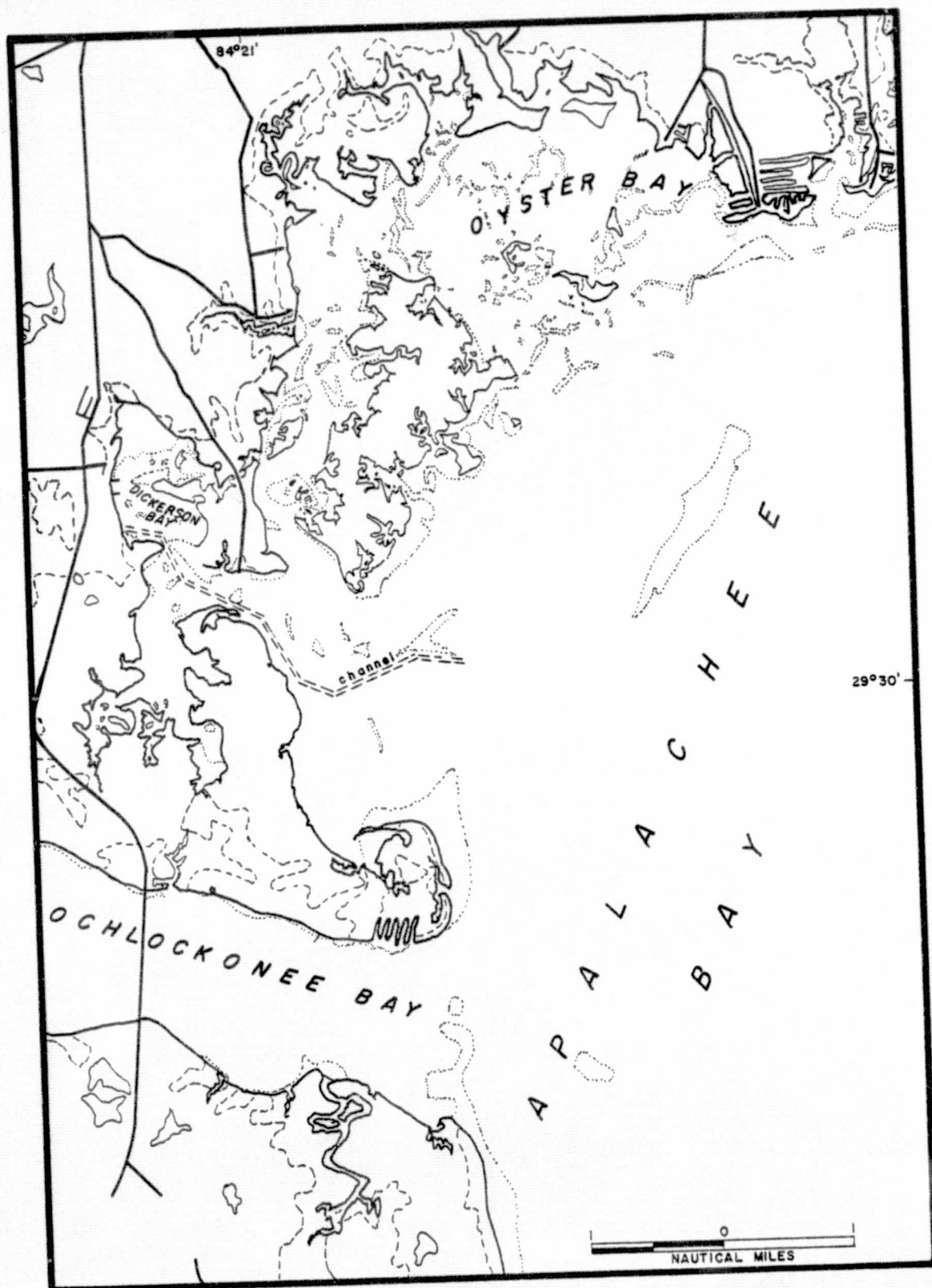


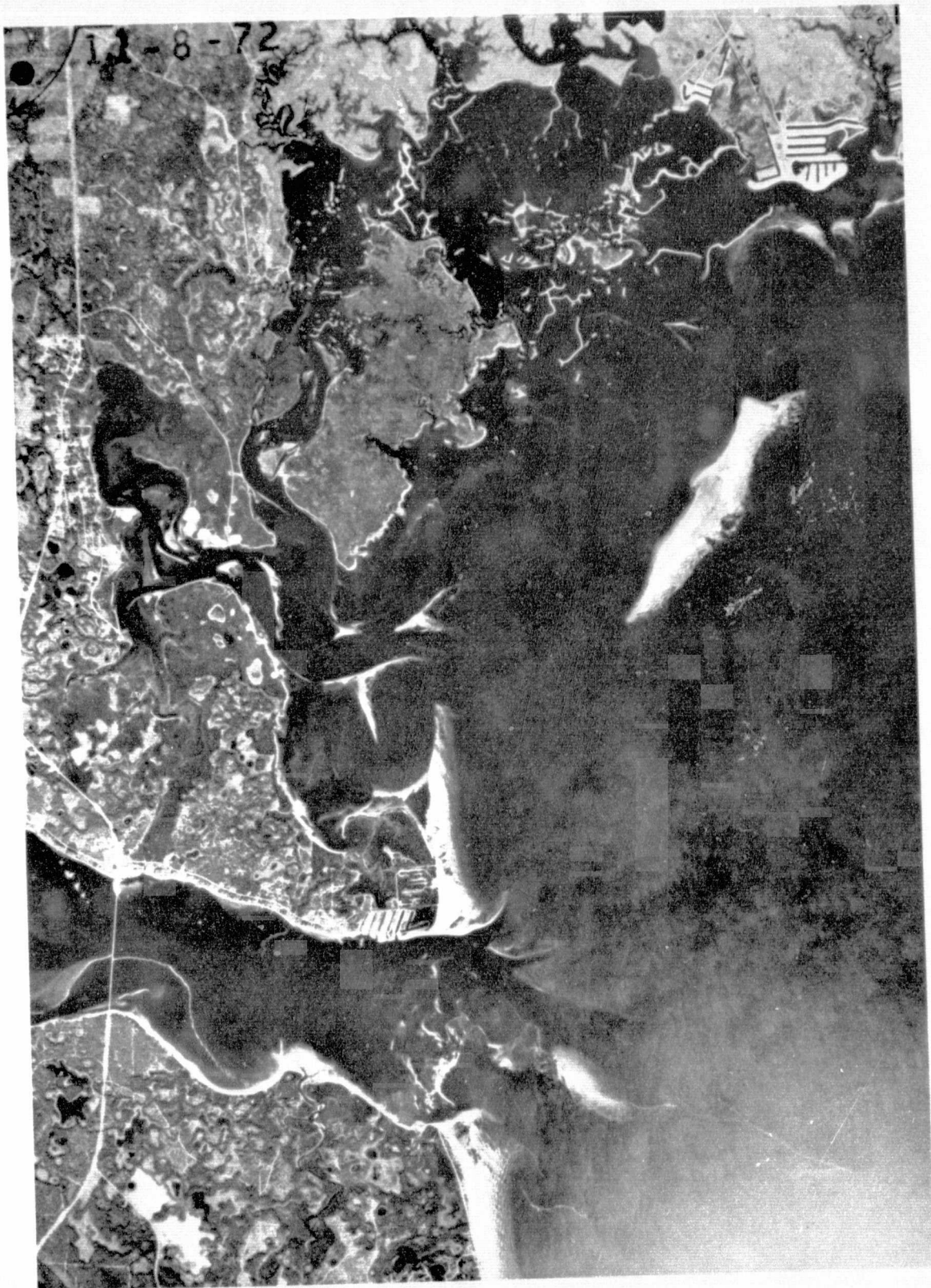
Figure 40.--Channel location and roads in the Panacea area.

Source: NOAA/NOS nautical charts.

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Figure 41.--Aerial view of Panacea.

Source: Mark Hurd color infrared photography, 1972.



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As previously mentioned, this is a limestone coast and rock may be encountered in the dredging operations. Such rock removal increases construction costs dramatically. Attempts to straighten the meandering navigational channel would be expensive. The shifting sands would increase maintenance problems. Such expenditures may not be justified for a small community that serves relatively few fishermen. Improvements, though, are needed to serve the existing fishing industry.

Due to the lack of storm protection, supporting facilities and industries, and potential hazardous navigation, this port should not be considered as a potential site for a large seafood park. A possible alternative site may lie to the south of Panacea, in the estuary of the Ochlockonee River.

Summary and Conclusions

The Remote Sensing Applications Laboratory at the University of Florida was asked to assist in the selection and evaluation of a potential site for an industrial seafood park as a step in providing for the future needs of the commercial fishing industry in northern Florida. This task was to be accomplished by employing various remote sensing techniques to pre-determined areas. These selections were based on a completed economic study and research by the Florida Agricultural Market Research Center (FAMRC). An objective emphasized the selection and evaluation of potential areas with respect to expansion and improvements of existing facilities, in accordance with identified problems and needs of the seven selected areas in five Gulf coast counties.

Our research suggests that the sports fishermen are generally better served by support installations and facilities in the panhandle of Florida than are those whose livelihood depend upon catching, processing and marketing seafood. The Florida Coastal Coordinating Council, in their regional analysis reports, makes no note of the facilities available to commercial fishermen, but report in detail boat ramps, marinas, and other facilities available to sportsmen. Sport craft basins were observed in many locations during the course of our study. These sport ports were probably constructed with public funds. This should afford argument for the commercial fishermen for like expenditures.

In regard to the original objective, the data collected and analyzed by this laboratory and the FAMRC suggests that a centralized seafood park is not justified at this time. A change in the present commercial fishing industry of the Florida panhandle must occur before such justification can be given. An increased demand for fishing, requiring the utilization of previously little known and unused species, must occur before transformation in the attitudes and fishing methods takes place. The present habits of the fishermen and the distances involved suggest that the expansion and improvement of commercial installations would best serve the industry.

In the event that a park were justified, the laboratory suggests several possible locations. These selections are based on various physiographic and hydrographic considerations, as well as industrial and cultural development, available support facilities, and geographic location. Possible sites include Dyers Point in Panama City, the Palm Point area near Port St. Joe, the Turtle Harbor area and the location south of the airport in Apalachicola, and the estuary of the Ochlockonee River. Panama City and Apalachicola have the best supporting industries, while Port St. Joe offers space for development. Because of the centralized geographic position of Apalachicola, more use might be made of a park at this location.

The recommendations, comments, and major considerations made in regard to the selection and evaluation of identified needs in the study areas are summarized in Table 54. The findings in this report are offered only as suggestions. Local socio-economic factors and other factors not determined in our cursory study could be of overwhelming importance.

Table 54.--Summary of the recommendations and major considerations for seafood port improvement in north Florida.

Port	Identified need	Recommendations and comments	Major considerations for recommended location ^a	
			Advantage	Disadvantage
Pensacola	Docking	1) Renovate downtown location 2) Establish facilities in Bayou Chico	Present marine facilities Present industrial location	Limited space Bridge obstruction; additional dredging
Panama City	Docking	1) Utilize and expand St. Andrew Marina, develop waterfront north of marina. 2) Utilize downtown marina develop waterfront to the west;	Present marine facilities Present marine facilities	Cost of deep water construction Proximity to downtown
	Breakwater	Incorporate in new construction		
Port St. Joe	Docking	Limited expansion along north side of Gulf County Canal	Storm protection	Land elevation
	Channel	Maintained depth should be adequate for present fishing operations		
Apalachicola	Docking	Develop facilities up Scipio Creek	Elevation of land; storm protection	Bridge obstruction; necessary piling construction
	Channel	Present channel depth adequate unless facility is constructed up Scipio Creek		
Eastpoint	Breakwater	Location spoil west of present location; incorporate sheet piles in construction		
Carrabelle	Docking	Develop facilities on Timber Island	Storm protection	May encounter rock during construction
Panacea	Docking	1) Develop facilities on Hungry Point 2) Develop facilities on Porter Island 3) Expand existing facilities	Requires less dredging Greater available space Present marine facilities	Possible space limitation Distance from existing facilities Limited space
	Channel	Maintain adequate depth in present channel; not economically feasible to straighten channel		

^aDue to limited space, all advantage and disadvantages included in the text are not listed above.

Glossary

alluvial	- recent deposits in the form of clays, sands, gravels, peats, etc.
arcuate	- curved or bowed
arcuate reentrant	- any curved or bowed indentation in a landform
bathymetry	- relating to measurements of depth
cusate	- point formed by two intersecting crescents
diastrophic	- relating to the processes of earth movements, that is, upheaval or settling
eustatic	- pertaining to world wide changes in sea level
homocline	- a group of inclined beds all dipping in the same direction
meander	- one of a series of somewhat regular and looplike bends in the course of a stream
paleodune	- inactive ancient sand dune
prograde	- to advance seaward resulting from nearshore deposition of sediments brought to the sea by rivers
Recent	- all geologic time and deposits from the close of the Pleistocene, less than 10,000 years
surficial	- unconsolidated alluvial occurring on the earth's surface
tectonic	- pertaining to the work structure and external forms resulting from the deformation of the earth's crust

Organizations Offering Available Imagery and Information

<u>Address</u>	<u>Type of Imagery or Information</u>
Florida Department of Natural Resources Division of Resource Management Bureau of Coastal Zone Planning Crown Building 202 Blount Street Tallahassee, Florida 32304	Coastal Zone Management Atlases
Florida Resource and Environmental Analysis Center 362 Bellamy Building Florida State University Tallahassee, Florida 32306	Mark Hurd color infrared photography Mark Hurd black line photos covering USGS quadrangle sheets
U.S. Army Corps of Engineers Mobile District Office P.O. Box 2288 Mobile, Alabama 366	Black and white photography covering Corps projects
U.S. Department of Agriculture Agricultural Stabilization and Conservation Service 2222 West, 2300 South P.O. Box 30010 Salt Lake City, Utah 84125	Black and white photography, sequential coverage
U.S. Department of Commerce National Oceanic and Atmospheric Administration NATIONAL OCEAN SURVEY Rockville, Maryland 208	Nautical charts
U.S. Department of the Interior U.S. Geological Survey EROS Data Center Sioux Falls, South Dakota, 57198	Satellite imagery
U.S. Department of the Interior U.S. Geological Survey NCIC Headquarters 507 National Center Reston, Virginia 32306	Topographic maps (quadrangle sheets) Satellite image mosaic of Florida, 1973 Individual satellite image maps from mosaic

Additional information available upon request from the Remote Sensing
Applications Laboratory, 346 Weil Hall, University of Florida, 32611